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Animal Keepers' Forum

The Professional Journal of AAZK, Inc.

January 1995



Dedicated to Professional Animal Care

ANIMAL KEEPERS' FORUM, 635 S.W. Gage Blvd., Topeka, KS 66606-2066
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**January 1995
Volume Twenty-two
Number One**

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AAZK PUBLICATIONS - CONTINUING DATA COLLECTION

Zoo Infant Development Project -

Teri Maas/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Kim Livingstone, L.A. Zoo (Passerines)

Jeanne Bocconcelli, Newark Museum Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Grand Rapids, MI



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Information for Contributors

Animal Keepers's Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration.

Articles should be typed or hand-printed and double-spaced. All illustrations, graphs, charts and tables should be clearly marked, in final form, and should fit in a page size **no greater than** 15cm x 25½cm (6" x 10"). Literature used should be cited in the text (Brown, 1986) and alphabetically in final bibliography. Avoid footnotes. Include scientific name of species (as per ISIS) the first time it is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Black and white photos only are accepted. Color slides should be converted to black and white prints (minimum size 3" x 5") before submission. Clearly marked captions should accompany photos. Please list photo credit.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone or FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone is (913) 272-5821 Ext. 31. FAX (913) 273-1980.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the Animal Keepers' Forum editorial staff or the American Association of Zoo Keepers, Inc.
Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$2.00 each.

*This month's cover features an African elephant (*Loxodonta africana*) female and her young calf. The drawing is by Renee A. Price, an assistant keeper at the Myrick Park Zoo in La Crosse, WI, where she also works as a free-lance artist. Renee has captured the tenderly maternal nature of the female elephant in this drawing. In fact, this protective attitude towards youngsters may be seen throughout the herd which consists of mostly related females with their offspring. Still considered endangered in many parts of its range, the African elephant has made a successful comeback in some areas where anti-poaching protection has been effective. Elephant calves are born after a gestation period of 20 months and are not considered adult until about the age of 18 years. These highly intelligent animals form deep kinship bonds both within their own herd and with other herd groups. They are basically peaceful and nonaggressive unless threatened. Thanks, Renee!*

Scoops

and

Scuttlebutt

From the Editor

Please be aware that the index for *Animal Keepers' Forum*, Vol. 20, Nos. 1 - 12, 1994 appears at the back of this issue. We again wish to thank Pam Talbot, a volunteer at the Woodland Park Zoo, Seattle, WA, for her year-long efforts in compiling this index for AAZK. In using the index, please be certain to note the key section to help you locate information.

We want to encourage all of you to contribute to *AKF*. Consider sending in an article on your animals, your research, your observations, etc. Articles need not be lengthy to contain information interesting and important to AAZK members. Participate in the spread of enrichment ideas by contributing to the Enrichment Options column. Let others know of significant births and hatchings at your facility through the B&H column. Keep others aware of your Chapter's activities by regular submissions to Chapter News. *AKF* is your publication - help it grow and fulfill its mission as a keepers' forum by contributing in 1995. We always welcome comments and suggestions from our readers.

With the acquisition of new computer equipment, we plan on making some formatting and cosmetic changes to *AKF* over the coming months. Our goal is to maintain the integrity of the journal in regards to types of material published, while improving its visual image. We ask your continued support and patience while we go through this transition.

Awards Committee Solicits Nominations for 1995

Awards Committee Chair Anna Michel, Metro Washington Park Zoo, Portland, OR, has announced that the Committee is accepting nominations for the following awards which will be presented at the 1995 AAZK National Conference in Denver: 1) Certificate of Excellence in Exhibit Renovation, 2) Jean M. Hromadka Excellence in Zookeeping Award, 3) Meritorious Achievement, 4) Certificate of Merit for Zoo Keeper Education, and 5) Lifetime Achievement Award. Beginning in this month's issue of *AKF*, each award will be explained, its criteria presented, and procedures for nomination published. This month we begin with the Certificate of Excellence in Exhibit Renovation. Look for information of the other listed awards in the issues through April 1995. Nomination deadline is 1 June 1995. If you need further information, you may contact Anna at the Zoo - 4001 S.W. Canyon Rd., Portland, OR 97221.

Additionally, the AAZK Board of Directors accepts nominations for Certificates of Recognition and Appreciation throughout the year. The Certificate of Recognition is to honor someone within AAZK, Inc. for their work on behalf of the Association. The Certificate of Appreciation honors individuals outside of AAZK, Inc. for works deemed by the Board as worthy of special recognition. These awards are voted upon by the AAZK Board.

AAZK Grants Available

The American Association of Zoo Keepers announces the availability of two \$750.00 research grants in the field of zoo biology. Interested applicants should direct their inquiries to: Sue Barnard, Chairperson, AAZK Research/Grants Committee, Zoo Atlanta, Department of Herpetology, 800 Cherokee Ave. S.E., Atlanta, GA 30315. The deadline for submissions is 1 March 1995.

Great Lakes Regional Council Meeting Announced

The River City Chapter of AAZK will be hosting the Great Lakes Regional Council Meeting on Wednesday, 15 March 1995 in Grand Rapids, MI. Stay tuned to the *Forum* for more information, or contact Tim Sampson; day - (616) 336-4301; evenings - (616) 451-9227.

ADT Forms Available Upon Request

Animal Data Transfer Forms for zoos and aquariums are available free of charge upon request. This is a professional service provided by AAZK. Contact: Bernie Feldman, Burnet Park Zoo, One Conservation Road, Syracuse, NY 13204. If your facility is not already using the ADT form, please encourage your administration to implement its use whenever an animal is shipped.

Scientists Center for Animal Welfare Sponsors International Conference

The Scientists Center for Animal Welfare is sponsoring a two-day international conference May 8-9, 1995 in New Orleans, LA. The theme for the conference is "The Well-being of Animals in Zoo and Aquarium Sponsored Research". Co-sponsor for the event is the American Veterinary Medical Association (AVMA).

General sessions will include: How Are Research Concerns Different in Zoos and Aquariums?, Ethical Considerations for Conservation Research, Trends in Environmental Enrichment, and The Role of the Institutional Animal Care and Use Committee at Zoos and Aquariums.

For further information, contact: SCAW, 7833 Walker Dr., Suite 340, Greenbelt, MD 20770, tel: (301) 345-3500; fax: (301) 345-3503.



Committing to Conservation Workshop Planned

The Columbus Zoo is pleased to announce that in 1995 it will be hosting a conservation conference entitled ZOOS: COMMITTING TO CONSERVATION from 13-16 July 1995. The goal is to bring together field researchers and zoo personnel from all levels in order to promote *in-situ* conservation. Examples of successful projects and how zoos served a vital supportive role will be our main focus.

Tentative topics include: Connecting with a large conservation organization; Connecting with small N.G.O.'s; Sources for seed money; Environmental Education Projects; How to start a conservation project on \$1,000; Keeper-initiated conservation projects; Utilizing volunteer talent as a conservation resource; The role of zoos as a support infrastructure; Sponsorship of biologists in the field; and Assessing the benefits to indigenous people.

If you are interested in more information, would like to attend this conference or would like to present a paper please contact either Beth Armstrong/Ape House or Beth Pohl/Children's Zoo at The Columbus Zoo, Box 400, 9990 Riverside Drive, Powell, OH 43065-0400. Phone (614) 645-3426 or (614) 645-3442.



Executive Director's Report to the Membership

During 1994 the Board of Directors, in what many members of AAZK, Inc. have termed a long overdue and progressive step, hired me as your first Executive Director. I have received many congratulations from the membership, but in the same breath, I am usually asked "and what exactly will you be doing?".

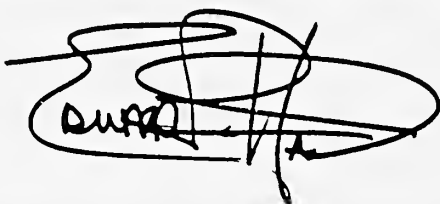
My principle function as Director will be in taking over the political responsibilities from the Association President that have infused (and confused) the Association with the advent of non-profit status. There are so many laws, rules and regulations that govern tax-exempt entities, that they are literally mind-boggling. The past two Presidents have spent much more time managing the fiscal area of AAZK instead of developing avenues to improve the quality of membership.

My number one priority is to work for the membership, under the supervision of your Board of Directors, to explore avenues of financial stability. What this means literally is to remove the financial burden of operating this Association from the backs of the individual member. The zoo keeping profession is not afforded the luxury of a traditional salary scale. Wages do not necessarily reflect the cost of living expenses for a particular geographic area. With that in mind, the membership costs of this Association must remain low and affordable to everyone.

The potential financial target can and has shifted to Conferences, Corporations, and mostly, to our Chapters. A group of AAZK members, working together on one fundraising event per year, have the potential to keep membership dues at the same level, period.

Again, this is my primary focus. I will continue to develop more ideas and will share them with you in monthly reports. Please feel free to contact me at this office with questions and suggestions.

Ed Hansen
AAZK Executive Director



AAZK Announces New Professional/Contributing Members

Richard Bard, WCP/Bronx Zoo (NY)
Lawrence Newman, National Zoo (DC)
Kelly Carpenter, Columbus Zoo (OH)
Doug Vineyard, Columbus Zoo (OH)
Michelle Muniz, Audubon Zoo (LA)
Stacy St. Hilaire, Ft. Worth Zoo (TX)
James Webb, West Coast Game Prk
Diane Koskie, Los Angeles Zoo (CA)
Carole Garrett, Sacramento Zoo (CA)

Monika Stroeber, WCP/Bronx Zoo (NY)
Tom McCloskey, Zoo Atlanta (GA)
Lynn Kester, Columbus Zoo (OH)
Robert Stanton, Detroit Zoo (MI)
Aimee Early, Dallas Zoo (TX)
Jeff Case, San Antonio Zoo (TX)
Claire Waite, Prescott Animal Prk. (AZ)
Lisa Estrin, The Living Desert (CA)
Lisa Graham, Bowmanville Zoo (Canada)

Lani Pidot Prussing, Molokai Ranch Ltd. (HI)

New Contributing Members

Milwaukee County Zoo Library, Milwaukee, WI

Renewing Contributing Members

Joan Schultz, Boomer Ball, Grayslake, IL
John Tobias, Director, Miller Park Zoo, Bloomington, IL
Dickerson Park Zoo, Springfield, MO
Martine Colette, Wildlife Waystation, Angeles Forest, CA
Gerald W. Murrie, San Diego, CA

Coming Events

The AZA School for Professional Management Development of Zoo & Aquarium Personnel and AZA School for Applied Zoo & Aquarium Biology

February 5-9, 1995

Wheeling, WV

To be held concurrently at Oglebay Park. For further information and application, contact the AZA Office of Membership Services, Oglebay Park, Wheeling, WVA 26003 (304) 242-2160.

The 1995 Sea World Whale Symposium

February 18, 1995

San Diego, CA

Optional college credit available from San Diego State University. For further information, contact: Robin Kendall, Sea World Education Dept., 1720 South Shores Rd., San Diego, CA 92109 (619) 226-3903, FAX (619) 226-3634.

The AZA Conservation Academy, School for Zoo & Aquarium Management, Studbook Keepers' Course and SSP Coordinators' Course

February 18-23, 1995

St. Louis, MO

Courses will be held concurrently. For further information and application, contact: Debra Boyster, AZA Conservation Academy, St. Louis Zoo, Forest Park, St. Louis, MO 63110 (314) 781-0900, ext. 297.

13th Annual Symposium of the National Wildlife Rehabilitators Association

March 1-5, 1995

Minneapolis, MN

This educational conference is designed to advance the profession of wildlife rehabilitation and to foster cooperation among various disciplines concerned with wildlife survival and awareness of our environment. For more information contact: NWRRA, 14 North 7 Avenue, St. Cloud, MN 56303; phone (612) 259-4086.

Symposium on the Nutrition and Medicine of New World Primates

March 12, 1995

Louisville, KY

Hosted by the New World Primate Taxon Group of AZA. The conference will be held the Sunday before the AZA Mid-Western Regional Conference. The theme will be the medicine and nutrition of New World primates during different life cycles (i.e., pregnancy, lactation, neonatal and geriatric). Speakers will discuss the basic physiological changes as well as management of medical and nutritional diseases that may occur during each life cycle. For further information contact: Dr. Peregrine Wolff, Minnesota Zoological Garden, 13000 Zoo Blvd., Apple Valley, MN 55124 USA; Phone (612) 431-9361, FAX (612) 431-9367.

Joint Conference of the Australasian Regional Association of Zoological Parks and Aquariums (ARAZPA) and the Australasian Society of Zoo Keeping (ASZK)

April 3-7, 1995

Perth, WA

The theme is "Partnerships for Conservation". Will include paper sessions, keynote speakers, and *in-situ* visits to conservation areas. For further information contact: Eveline Read, Conference Coordinator, Perth Zoo, P.O. Box 489, South Perth WA 6151.



From the President.....State of the Association

We accomplished many of our goals established by the membership and the Board for 1994. I am pleased to announce that the *Zoo Infant Development Notebook, Mammal Section* has been published. The cost of the two-volume set is \$125.00 for members and \$150.00 for nonmembers. Harmony Frazier and Kathleen Hunt, Co-Chairs and the committee are to be commended for a job well done. This is a resource notebook that every zoo should have in its library.

Conservation continues to receive outstanding support from AAZK. Bowling for Rhinos (BFR) was again very successful with \$100,000.00 raised for the Ngare Ndare Forest Preserve. The Board approved the proposal to expand funding in 1995. Funds in excess of \$100,000.00 will be sent to Ujung Kulon through the "Adopt A Park" program. The Conservation, Preservation and Restoration Committee (CPR) has been developing a Zoo Keepers Grant in Conservation Packet that is close to completion.

This is the 20th year of continuous publication of the *Animal Keepers' Forum*. Articles have come from the U.S., Canada, England and India. The March issue was dedicated to Elephant Management. Advertising revenues were up last year, but AKF experienced a 3% increase in postal rates in November. The Publications Funding Committee has developed an advertising solicitation packet to be sent to potential advertisers this coming year. Susan has been working with a consultant to formalize ways to make AKF more visually attractive. The Board approved the purchase of much-needed upgraded computer equipment not only for AKF, but the Administrative Secretary as well.

The new Chair for the Nominations and Elections Committee is Maria McManus, Indianapolis Zoo. The committee will implement a new method for selecting the President and Vice President by an Executive Committee. Anyone who wishes to run for the Board of Directors must have their biographical and nomination forms in to the NEC Chair by 31 January 1995.

In view of the current Federal Regulations and Non Profit 501(c)(3) members rights to participate, the Bylaws Committee will review the Bylaws for changes in membership status and eligibility for service on committees. The Board approved the wording for the Executive Director text for Article VI, Section 1d. This Bylaw amendment was ratified by the membership during the 1994 National Conference in Omaha.

Two committees are maintaining their timeline for developing materials for publication. A first draft of some sections of the Keeper Training Package have been completed. A mock-up of the Package should be given to the Board at the 1995 Denver Conference. This will be a teacher's guide on how to use the packet resources. The Inspection Standards Committee has been working on text reviews and is targeting a final draft for the next annual meeting.

The newly established Enrichment Committee have been developing their goals. An Enrichment Workshop was held at the 1994 Conference and the Enrichment Options column will be continued in the AKF. It was noted that AAZK, Inc. cannot give recommendations on products, but can explain how they are used.

Two proposals were approved by the Board of Directors at the annual meeting. The first was from Lesa Scheifele and Kathy Kelly to promote the National Zoological Park-AAZK Chapter's outreach project M.A.R.C. (Making A Realistic Contribution) from an NZP Chapter sponsored project to a recognized function of AAZK at the National level for the purpose of maximizing and broadening its current effectiveness and success. This is an international outreach program that supplies professional and scientific materials to zoos, universities working with zoos, wildlife orphanages, and wildlife sanctuaries in countries which have no ready access to such materials. The NZP Chapter supported this proposal.

The second proposal was from Jeanette Beranger to establish an International Assistance Committee to coordinate professional zoo keepers with projects or facilities that are in need of technical assistance. After much discussion a new name was chosen - International

From the President, Continued

Outreach Committee - and a new framework was approved for the coordination of all outreach-type activities. The following flow chart defines the concept of its organization:

INTERNATIONAL OUTREACH COMMITTEE

Ric Urban, Board Overseer

Jeanette Beranger, IOC/Chair

To address which of the four committees best serves the purpose of the request

Jeanette Beranger, ITA/Coordinator

INTERNATIONAL TECHNICAL ASSISTANCE

To provide outreach assistance for technical/training assistance

Lesa Scheifele, IA/Coordinator

INTERNATIONAL AFFAIRS

To network/communicate with other AAZK, Inc.-like organizations.

Lois Johannes, FMSP/Coordinator

FOREIGN MEMBER SPONSORSHIP PROGRAM

To assist developing nations zoo staff individuals to acquire sponsorship for a paid membership in AAZK, Inc.

Kathy Kelly, MARC/Coordinator

MAKING A REALISTIC CONTRIBUTION (M.A.R.C.)

To provide written educational/resource materials, journals and books to developing nations zoos and staff.

Remember, membership services are available because of your annual dues, so please avail yourself of these services which are listed in the *Animal Keepers' Forum*. The Board also wishes to thank those individuals and Chapters who have donated funds to the Association to assist us in our endeavors to meet and build upon the goals set forth by our membership.



Janet McCoy, President AAZK, Inc.
Washington Park Zoo, Portland, OR



Information Please

Our 36-year-old female Chimpanzee (*Pan troglodytes*) is recently exhibiting self-oriented, stereotypic behavior fits: pulling at her ear with her foot, slapping her head with her hands, low screeching vocalizations. Sometimes these fits lead to a fight, which she initiates, where she then vomits. If you have seen any similar scenarios with your chimps, or have any useful information, please write: Ann Stevens, Primate Dept., Dallas Zoo, 621 E. Clarendon, Dallas, TX 75203; phone (214) 670-6833.

Information is required on the following two conditions: (1) Seizures in bears (Syrian Bear) at any age; (2) Arthritis in felines of any age (Siberian Tiger). Data requested on symptoms, treatment, and studies that have been done in helping animals that have these two conditions. Please write to or call: Kathy Fields c/o Zooland Animal Park, P.O. Box 2589, Gulf Shores, AL 36547; (205) 968-4910.



AAZK Award Nominations Are Now Being Accepted for 1995!

The AAZK Awards Committee would like to begin accepting nominations for the **Certificate of Excellence in Exhibit Renovation (CEER)** to be presented at the 1995 AAZK Conference in Denver, CO. The deadline for all award nominations is **1 June 1995**. All award nominations received after 1 June will be reviewed for 1996, so please keep this in mind when submitting your nominations.

All awards given by the AAZK do not have a minimum or maximum number offered each year. Also, if the nominees do not meet the qualifications and nominators do not follow the nomination procedures, they will not receive the award for which they were nominated. Please include scientific names of animals when they are included in the nomination of a special or outstanding breeding acknowledgment.

Please submit all nominations to:

Anna Michel, AAZK Awards Chair
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, OR 97221

CERTIFICATE OF EXCELLENCE IN EXHIBIT RENOVATION (CEER)

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Certificate of Excellence in Exhibit Renovation (CEER) presented by the AAZK Awards Committee. The purpose of the award is to recognize institutions or organizations in the zoological community for the design and renovation of existing animal facilities which involved active keeper participation in the process.

The character of the award includes; a certificate, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes: Volume 1; United States and Canada. The latter being published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The CEER was established by Janet McCoy, 1990 CHAIR. Bill Whittaker proposed the award to the AAZK Board of Directors. The award is presented at the annual AAZK National Conference.

Qualifications:

1. Any North American zoological institution or organization is eligible.
2. The renovated exhibit must be in full operation for at least two years.
3. The exhibit must be nominated by a keeper at that same institution or organization. Supporting nominations may be submitted by management personnel from the same institution.

Nomination Procedure:

1. List institution or organization's name, address, phone and Director.
2. **Document** local awards or commendations for exhibit, drawings, 8 X 10 color photos - no slides (2 before and 8 after), and renovated exhibit type: single or multispecies, and size.
3. **Document** keeper participation in the design and why the existing facility was renovated.

CEER Award Criteria, Continued

4. **Document** interface with other zoo divisions; and maintenance of exhibit after completion.
5. The deadline for nominations is **JUNE 1st** of each year.

NOTE: Materials will not be returned, but forwarded to the Exhibit Design Committee.

Selection Procedure:

The Awards Committee, consisting of five (5) keepers, will independently review each nominee.

Nominee Evaluation:

The evaluation of each nomination is broken down into four categories based on the general guidelines outlined for the award. The four categories are: Keeper Involvement, Exhibit Functionality, Exhibit Management and Visitor Point of View/ Other Information. Items the committee is looking for are the following:

- A. **KEEPER INVOLVEMENT:**
 - a) degree of keeper involvement with conceptual development of exhibit
 - b) degree of keeper involvement with facilitation of completion of exhibit, (fund raising, promotion, assist with construction)
 - c) contribution to educational experience (graphics, conservation message)
 - d) originality - is it something new and different, or has it been tried before
- B. **EXHIBIT FUNCTIONALITY:**
 - a) versatility - indoor/outdoor, four seasons, protection from elements
 - b) accommodates and encourages animal's natural behavior - climbing structures, land area, height, water
 - c) hard (gunite, concrete) vs soft (grass, dirt) environments - as to animal needs
 - d) sight lines valuable to animal as well as visitor - important to some animals (polar bear, chimps)
 - e) physical and visual barriers for animal's use, animal safety
 - f) flexible entrance/exits (hoofstock - more than one entrance)
 - g) ability to exhibit natural social grouping
 - h) breeding success
- C. **EXHIBIT MANAGEMENT:**
 - a) how management of exhibit interfaces with other zoo divisions (grounds, maintenance - simple repair, paint)
 - b) keeper serviceability, overall maintenance of exhibit and surroundings
 - c) adequate drains and properly located
 - d) quality and versatility of holding areas - ease of separating animals, moving, breeding, sick
 - e) keeper sight lines - can you see animal when they come into holding or when shifting them between areas, keeper safety
 - f) ease of providing time change items (browse, logs, feed, novel objects)
 - g) environmental control (ease of seasonal adjustments - ventilation, heat)
- D. **VISITOR POINT OF VIEW/OTHER INFORMATION:**
 - a) educational experience (conservation message)
 - b) immediate and sustained viewer interest
 - c) sight lines - not see doors, drains, fencing - does it have esthetics
 - d) bonus point - local awards, commendation, "wow" factor
 - e) include anything else pertinent to the renovated exhibit that you think is important



The Zookeepers Grant in Conservation

The Zookeepers Grant in Conservation has been developed to promote and support efforts in conservation by keepers and aquarists in zoological parks and aquariums around the world.

Members of AAZK in good standing are encouraged to apply for the two \$500.00 minimum grant awards offered by AAZK, Inc. through the Conservation, Preservation and Restoration Committee (CPR). Applications are accepted through 31 March of each calendar year. The Committee will review and select the two most qualified applicants from that particular calendar year. Applicants will be notified by 1 August of the same calendar year of the outcome of the grant application process.

This grant was designed to lend support to a broad range of conservation endeavors. All appropriate applications are considered as to their beneficial impact on species of flora and fauna within defined ecosystems.

We have intended for AAZK members to be conduits for conservation efforts and as long as they are actively involved, they may apply for financial support.

Applications will be evaluated in 10 subject areas by the CPR Committee members. The subject areas are as follows:

1. Long-term commitment demonstrated to project
2. Other financial support the project receives
3. Resources available to the project and personnel support
4. Preparedness of application
5. How well-planned and thought out the project is
6. Biological significance, endangerment and specific threats to project
7. Impact of information learned on existing biological knowledge
8. The extent of the applicants' resumé and expertise of others involved in the project
9. How well does the project fit into the goals of CPR?
10. What is the extent of the applicants' involvement in the project?

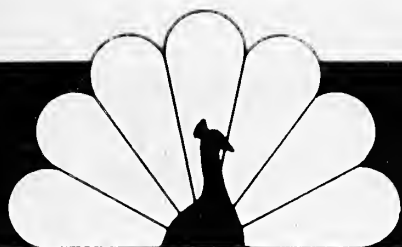
Applicants should consider the above mentioned categories when preparing their applications.

The Zookeepers Grant in Conservation is designed to be used for buying equipment, supplies and materials for projects. Travel expenses, wages and animal purchases are not included. Other grants should be pursued for these type of expenditures. Currently the Zookeepers Grant in Conservation, if awarded, will have funds allocated on a reimbursement basis. If large sums of money are necessary early in the project year, AAZK's Executive Director should be contacted for special permission.

For applications please write:

Bret Sellers, Chair
AAZK Conservation, Preservation and Restoration Committee
Metro Washington Park Zoo
4001 SW Canyon Rd.
Portland, OR 97221





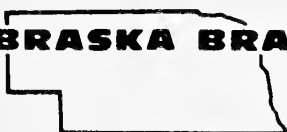
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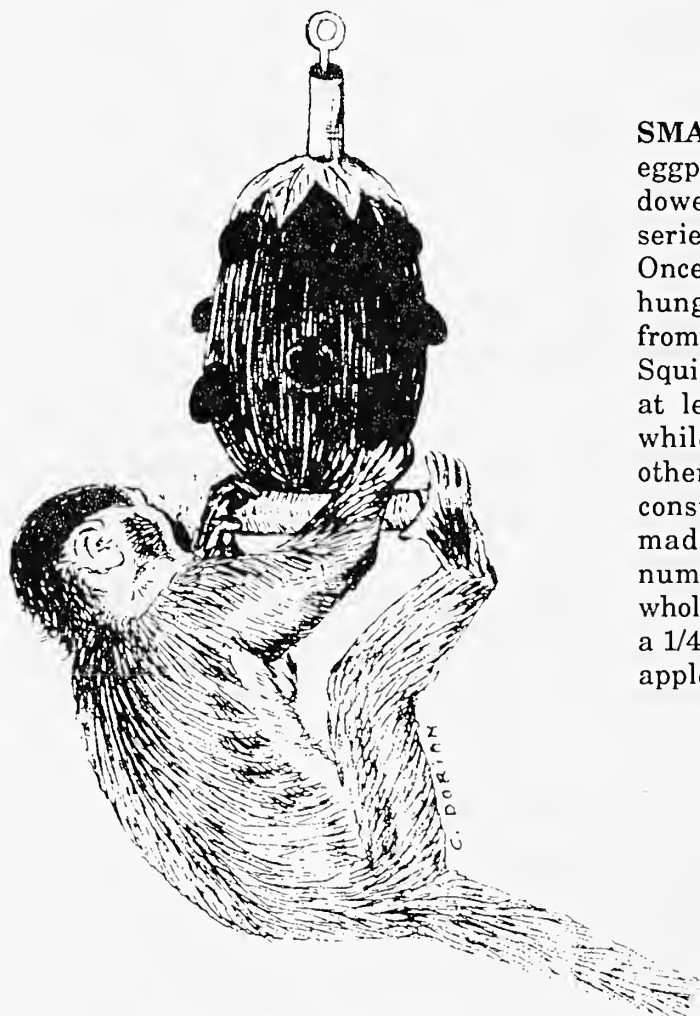
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By Kayla Grams, Arizona-Sonora Desert Museum
and Gretchen Ziegler, Wildlife Safari



SMALL PRIMATE FEEDER - A whole eggplant, pierced with a screw connected dowel structure (⌞ shaped), is cut with a series of date (or peanut shell) sized holes. Once the dates are inserted, the feeder can be hung with a double snap-lock (not shown) from any appropriate overhead structure. A Squirrel monkey (*Saimiri sciureus*) (shown at left) hangs from the feeder by one hand, while reaching for a dried fruit with the other. When emptied, the eggplant can be consumed also. A similar feeder can be made for small primates by pushing a number of shelled whole almonds into a whole apple (or similar fruit). Use the end of a 1/4 inch diameter dowel to push holes in the apple for inserting raisins.

A Lesser spot-nosed guenon (*Cercocebus fantiensis petaurista*) is shown at right browsing on the white flower buds of a thornless blackberry vine. Succulent stem-tip growths, including tender leaves (found throughout the spring), may also be eaten by Spot-nosed guenons, Squirrel monkeys, White-faced capuchins (*Cebus capucinus*), Spider monkeys (*Ateles paniscus*), and others. The mature vines of this blackberry can be twisted together to form natural perches for squirrels and other small primates.



--Camielle Dorian, Keeper
Monkey Zoo, Orinda, CA



Zoo Infant Development Two-Volume Reference Set

*Edited by Harmony Frazier, LVT, Woodland Park Zoo, Seattle, WA and
Kathleen Hunt, B.A., Dept. of Zoology, University of Washington*



The American Association of Zoo Keepers, Inc. is pleased to announce the availability of an important reference work. This 1820-page, two volume set is a reference manual of the physical and behavioral development of parent-reared mammal infants in captive collections. These volumes include normal rearing information and weights for many species and can be quickly utilized for quick comparison and reference when deciding whether an infant is being properly cared for or is in need of intervention.

The volumes are divided into four sections: 1) Infant Development Data Sheets (a total of 419 individual records); 2) Weight Data (including many charts and graphs); 3) Bibliography (144 pages of bibliographic references) and 4) Index (species included are indexed by both common and scientific names). The Infant Development Data Sheets and the Weight Section are subdivided by color coded taxonomic order tabs. The Zoo Infant Development Notebook is packaged in two sturdy 2-inch expanded D-ring binders and include a full-size page lifter for ease of use.

To order, fill out the form below and return with your payment to: AAZK, Inc. ZIDP Notebook, 635 S.W. Gage Blvd., Topeka, KS 66606-2066 U.S.A. Checks or money orders should be made payable to "AAZK, Inc." (U.S. FUNDS ONLY). If using a credit card, make sure to complete all requested information on form. Prices are:

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Florida's Oldest Panther Found Dead

He led a charmed life, wooing females and dodging death, but age finally caught up with him.

Florida Panther No. 12, the oldest male panther that game officials have known in the wild, and father of nearly half the young panther population in South Florida, died on 7 November in a territorial battle with a younger male rival. He was about 14 years old.

No. 12 taught researchers a lot about panther behavior, such as how social hierarchies work and territory is controlled. He also taught them that the endangered Florida panthers (*Felis concolor coryi*) are generally in good health and not decrepit as was previously believed, said former Florida Game and Fresh Water Fish Commission biologist David Maehr.

"No. 12 was your classic resident adult male. He set the standard by which we judge all other male panthers," Maehr said. "We got to see him be a dominant male and follow him to his natural demise."

The cat was one of 56 panthers fitted with tracking collars since 1981. He was found on 28 January 1986. By the time No. 12 was collected, he had established his home range, which stretched for 200 square miles at its peak, said game commission biologist Darrell Land.

Three or four years ago, game officials noticed No. 12's territory starting to shrink, taken over by more vigorous males. By the time he died, his home range had dropped to about 100 square miles.

>from ECO NOTES, The Topeka Capital-Journal, December 5, 1994



Assistance Please

Mammal Milk Needed for Lysozyme Study

Milk from any species of mammal is needed for a comparative study of milk lysozyme (EC 3.2.1.17; muramidase) activity. This study is intended to identify and characterize differences in milk which may be important in conservation efforts involving rearing of young animals. Although milk samples for all mammals are encouraged, we would particularly like to receive samples from the following species: Buffalo, Deer, Giraffe, Reindeer, Elk, Goat, Caribou, Cow, Camel, Llama, Sheep, Rabbit, Dog, Cat, Elephant, any Marine Mammal, Chimpanzee, Gorilla, Bear, Lion, Tiger, Horse, Pig, Zebra, Leopard and Rat. Ideally, we would like to receive a sample within 24 hours after a baby is born, one 7 days later, and one one month later. However, any milk samples will be appreciated.

Milk samples need only be frozen and shipped on dry ice. We will pay for shipping and handling. Samples can be accepted until late January 1995.

If possible, colostrum - one week and one month samples are appreciated.

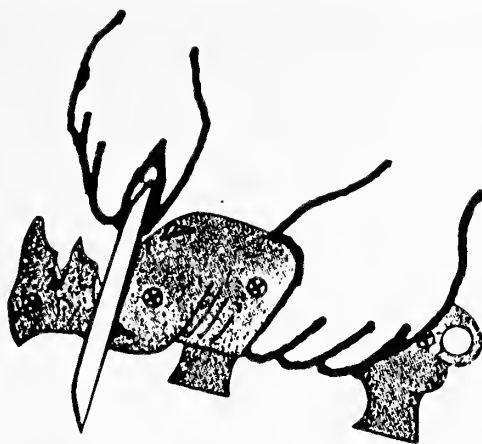
For further information, contact:

Joy Truesdale (708) 301-9161 or

Dr. Frank Pascoe, Dept. of Natural Sciences
College of St. Francis - Joliet, IL
Phone: (815) 740-3814
e-mail facnspascoef@vax.colsf.edu



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We have a limited quantity of these sharpeners available, so order now! The price includes domestic postage. Canadian orders need to add \$2.00 per sharpener for air mail postage. We are sorry we cannot fill orders from outside the U.S. and Canada on this particular item.

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Total enclosed:\$_____

Whales Win? The Antarctic Whale Sanctuary victory is sweet, but still needs defending

By Christina Yin, Media Relations Officer, WWF-Malaysia

In May, the International Whaling Commission voted to make 20% of the world's oceans around Antarctica a whale sanctuary. Proposed by France at the 1992 IWC meeting, the sanctuary links up with the existing Indian Ocean Sanctuary and means long-term protection from whaling for 90 per cent of the world's whales.

WWF, along with other conservation organizations, played a key role in this landmark event. Its work to protect whales stretches back to the 1960s, and recent concerted efforts to ensure the sanctuary's establishment culminated with a campaign that had WWF organizations from New Zealand to the United States fighting for a common cause: to safeguard the future of the world's remaining whales.

However, the sanctuary does not mean that the war is over: even though Russia voted for the proposal, it now wants to whale in the protected area. Under the complex workings of international agreements, Russia could make an "objection" to the sanctuary any time up to December, and it did so in September. Because it also officially objected to the whaling moratorium, this allows Russia to legally whale in the sanctuary. WWF is doing all it can to persuade Russia to withdraw its objection.

And even today, in defiance of the IWC moratorium, Norway continues commercial whaling and Japan persists in whaling for "scientific research" while promoting whale-meat eating through national campaigns.

What next?

Says WWF International Director General Claude Martin: "WWF has been working to conserve whales since 1961, and we have no intention of giving up now. We will continue to support the moratorium and help make the sanctuary a reality."

Future whale work includes monitoring the sanctuary to curb illegal whaling and ensuring aboriginal subsistence is more scientifically controlled.

"We must continue to encourage governments to support the moratorium and to pressure whaling countries to go along with the IWC's decisions," says Cassandra Phillips, WWF's Cetacean Officer.

Please help: To keep the Antarctic Whale Sanctuary a safe place, send a postcard to the Russian Ambassador of your country, or direct to President Yeltsin at: The Kremlin, 103132 Moscow, Russian Federation. Congratulate him on Russia's support for the sanctuary at this year's IWC meeting and urge him to withdraw the objection to the sanctuary.



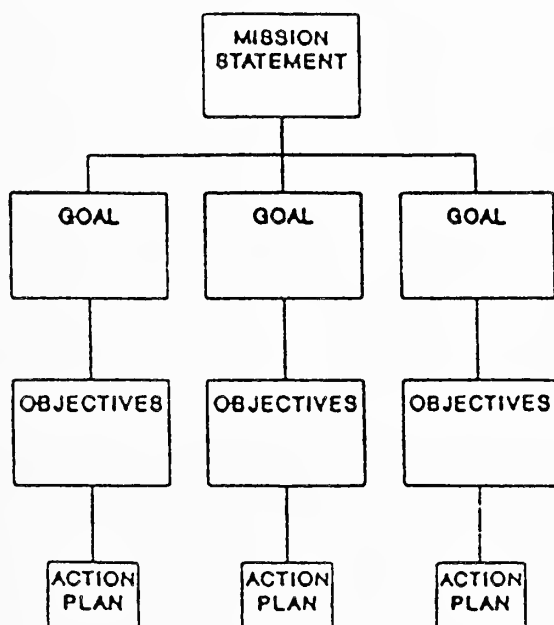
The Development of an Enrichment Masterplan

By
Allie Dewey
The Baltimore Zoo, Baltimore, MD

Introduction

The development of a masterplan creates the framework for the most effective implementation of enrichment on a continuous basis. Each step of the plan supports the overall purpose, or 'mission statement', which is to provide species appropriate enrichment as needed in each animal section. With the understanding that enrichment is beneficial to the animals, the mission statement is supported by three main goals: 1) to ensure enrichment becomes part of the daily husbandry routine; 2) to create an evaluation system; and 3) to provide a more educational experience for the zoo visitor. The goals are, in turn, supported by objectives which outline what is to be accomplished in each goal. The foundation of the masterplan is supported by action plans. Each plan contains the specific nuts and bolts of how the masterplan is to be implemented (see Figure 1).

Figure 1 - Masterplan Organizational Chart



Methods

GOAL 1. To Ensure Enrichment Becomes Part of the Daily Husbandry Routine

The objectives that supports Goal 1 are designed to create a new system of employing enrichment so that it truly becomes a part of the daily husbandry routine. This program reprioritizes enrichment from an opportunistic activity to an integral part of animal management. The ideas set forth are the result of many hours spent thinking about the role of zoo keepers and how zoos can better utilize their interests, knowledge, and enthusiasm.

The success of this goal is dependent upon keeper participation. Each animal section, comprised of keepers and a supervisor, would be responsible for developing an enrichment plan consisting of: 1) specific enrichment ideas; 2) the logistics of implementation; and 3) evaluation. In many cases this will mean developing plans for several different taxon

Enrichment Masterplan, Continued

groups within a given section. It is important to note that each area will be working as a team. Some suggestions for this include planning as a group, prioritizing enrichment needs, utilizing each keeper's best skills, devising a system so that keepers are accountable to each other, creating a budget, and discussing the evaluation results.

One of the most effective ways of sustaining a plan is to incorporate the provisioning of enrichment into a keeper's job description. This approach has two distinct benefits. First, it should serve as a motivator so that participation in the enrichment plan is closely related to one's personal evaluation. Second, and perhaps most importantly, because an individual has to be involved in the enrichment program, the involvement will expand the diversity of responsibilities, provide more daily stimulation and therefore, create more opportunity for professional growth. This in turn allows keepers to feel as though they are contributing more to the overall goal or mission of their zoo and/or conservation.

Lastly, the implementation of enrichment should be scheduled. This method ensures that all team members are aware of what items/methods are to be employed on what days and with that animals. Furthermore, scheduling assists with the logistical organization such as animal procedures, cleaning, maintenance, etc.

Action Plan For Goal 1.

I. Enrichment Team

- A. Keepers and Supervisor Meet
 - 1. define and prioritize enrichment needs
 - 2. discuss enrichment ideas
 - 3. create budget and approve with curator
 - 4. create keeper accountability system

II. North American Otter Enrichment Plan

- A. Enrichment Ideas
 - 1. minnows
 - 2. earthworms
 - 3. ice blocks
 - 4. apple
 - 5. browse
- B. Logistics - area worked by one person
 - 1. Minnows - order 250 minnows = \$20.00 plus shipping from Bill Voohries, Easton, MD. 50 gallon tank, filter, fish food
 - 2. Worms - 500 worms = \$25.00 from Hamburg, NY Store - in refrigerator
 - 3. Ice blocks - freeze large and small containers of water
 - 4. Apple - order from the Commissary
 - 5. Browse - cut on the appropriate day. Walk or schedule to use the Mammal Dept. truck

C. Otter Enrichment Schedule

	S	M	T	W	TH	F	S
10:30		ice block		apple		ice block	
1:30	minnows		browse		earth worms		earth worms

Enrichment Masterplan, Continued

D. Evaluation

1. day by day basis by appropriate keeper
 - a. use check sheet - did animals use the enrichment? yes/no - check 3x day
 - b. recruit volunteer to watch for 1/2 hour after enrichment is given
2. assess effectiveness biweekly with enrichment team, make appropriate changes at this time
 - a. are minnows worth the expense in time and effort?
 - b. do earthworms entice the otters to dig for their own worms?
 - c. should the apple be given chopped and whole?
 - d. do animals spend more time in the water?
 - e. does the schedule work?

III. Black Bear Enrichment Plan

A. Enrichment Ideas

1. browse
2. ice blocks
3. minnows in tub or pool
4. food in holes of Boomer Ball®
5. whole foods - more seasonal fruit
6. multiple daily feedings
7. food in the log
 - a. items/methods can be rotated weekly
 - b. coordinate schedule with otter schedule (e.g. cutting browse)

B. Logistics

1. browse - cut approved spp. - arrange to use the truck on designated day
2. ice blocks - freeze milk jugs or buckets
3. use otter minnows in black rubber tub
4. use Boomer Ball® from Big Cat section
5. whole foods - contact nutritionist/Commissary person for availability/cost

C. Black Bear Schedule

	S	M	T	W	TH	F	S
AM	scattered food	whole seasonal fruit	browse	ice blocks	Boomer Ball® w/food or worms	ice blocks	tub with minnows

D. Evaluation - similar to otter evaluation

1. do bears destroy the tub in which minnows are placed ?
2. do they habituate to items over a 2-week period? 4 weeks? or months?
3. design check sheet to focus on habituation

GOAL 2 - To Create an Evaluation System

Objectively evaluating enrichment is just as important as providing it. Methods of evaluation can range from a very simple check sheet to a more formal research project. The first step should be to include an enrichment category on the daily report form, e.g.: what was given and how, was it eaten, used, ignored?, etc. Another simple but informative method would be to use a check sheet per animal or group of animals. If, for instance, a foraging activity was given to a chronically pacing bear, a keeper would check whether the animal was pacing, foraging, exploring, resting, etc. at a predetermined time interval,

Enrichment Masterplan, Continued

say every 30 minutes. Collated information of this kind can be shared in valuable mediums such as *Animal Keepers' Forum*, *The Shape of Enrichment* newsletter, *Ratel*, or continuing education and docent meetings.

The most quantitative method of evaluating enrichment is to conduct a research project. Not all keepers are familiar with or comfortable with formal research (testing a hypothesis), however there are tools to overcome this. *Research Methods for studying Animal Behavior in a Zoo Setting* (Mellen et al. 1988) is an excellent introduction to conducting research. Another possibility is to offer a keeper research training course (more professional growth). Such a course provides an excellent opportunity for keepers to rigorously evaluate enrichment and to share the results at professional meetings and/or in a journal such as *Zoo Biology*.

Zoo docents, interns, and students are an excellent resource for assisting with projects and evaluation. For many zoos utilizing volunteers is crucial to conducting research. Training volunteers can be one on one or, a group training which focuses on one particular project/evaluation. To form a pool of research-oriented volunteers, a formal course can also be offered.

Action Plan For Goal 2.

I. Evaluation Methods

A. Simple to Complex

1. Simple

- a. keeper daily report forms
- b. animal check sheets designed for each animal
- c. use docents, interns for assistance in evaluation
 - (1) coordinate with volunteer coordinator, recruitment and scheduling

2. Complex

- a. introduction to research methods in a zoo
(Mellen et al. 1983) in zoo library
- b. keeper research training course taught by zoo research staff member or behaviorist
 - (1) a multi-month course designed to cover all forms and aspects of research
- c. use university students, interns to assist with, or conduct their own, projects
 - (1) confer with volunteer coordinator
- d. research conducted by curatorial staff

II. Review of Results

A. Enrichment Team evaluates the evaluation process

B. Enrichment Team reviews results of evaluation

1. make recommendations for enrichment changes

C. Maintain enrichment records for each animal section

1. section notebooks
2. ARKS

GOAL 3 - To Provide a More Educational Experience for the Zoo Visitor

The presence of enrichment serves as a tool in explaining an animal's natural history. Such an understanding should help visitors appreciate why a particular enrichment method or item is being used. The medium for conveying this information can be standard graphics, personal interpretation (docents), or interactives.

It is admittedly difficult to get detailed information across to the general public via graphics. However, there are different forums for teaching the principles, theory and application of enrichment. Educating the educators is an important first step. By doing so, a system is created for channeling information into all areas of an education department.

Enrichment Masterplan, Continued

A one to two day enrichment workshop for zoo educators could be held on a regional level, e.g. at AZA regional conferences, or on a smaller scale such as an in-house training. Information obtained by educators during this kind of workshop can be shared with local school teachers who are then able to incorporate it into a curriculum and/or use it in preparation for zoo visits. This information can be taught in formal zoo docent training classes, which in turn is passed on during guided zoo tours, school programs, and zoomobiles. Enrichment can also be used in summer camps for gifted and talented kids.

Action Plan for Goal 3

I. Education/Enrichment Group: education curator, zoo graphics artist, enrichment team

A. Identify Animal and Corresponding Enrichment

1. decide on the kind of interpretation
2. materials and cost
3. text or form

II. Incorporate Enrichment into Education Program

A. Zoo Educators' Workshop on Enrichment

1. in conjunction with AZA regional or annual conference
2. a host zoo with other local zoos attending
3. in-house training
 - a. apply for a grant for workshop support

B. Distribute Workshop Information

1. local school teachers, via training, newsletters, tours, in-service workshops
2. summer camps
3. junior keeper training
4. docent training
5. continuing education programs
6. animal rights organizations

III. Incorporate Enrichment into a Zoo's Mission Statement

- A. Conservation
- B. Education
- C. Research **AND**
- D. Enrichment

Summary

Why a masterplan? A masterplan facilitates organization by outlining all aspects of a program which, in turn, helps successful implementation. It not only prioritizes enrichment needs, resources, money and people power, but it makes such a program a priority itself.

The crux of an enrichment masterplan is keeper participation. Developing a system whereby keepers are responsible for generating ideas and implementing and evaluating them will ensure that enrichment becomes a part of the daily husbandry routine. Participation in the enrichment program is guaranteed by including enrichment responsibilities in keeper job descriptions.

Evaluating enrichment can range from simple check sheets to more formal research projects. Each method can be employed by the enrichment team, an intern, docents or university students.

Enrichment can benefit not only captive animals, but zoo visitors as well. Including enrichment into graphics can teach the public how enrichment is designed with an animal's specific natural history in mind. Educating educators can be accomplished via a

Enrichment Masterplan, Continued

workshop either locally, regionally, or nationally. Doing so assists with the dissemination of the principles of enrichment to the many programs an education department has to offer. Finally, to facilitate enrichment becoming integrated into a zoo, a zoo's mission statement should be expanded to include enrichment along side conservation, education, and research.

Conclusions

1. The development of an enrichment masterplan creates the framework for effective implementation of enrichment on a continuous basis.
2. The masterplan's three main goals are: 1) to ensure enrichment becomes part of the daily husbandry routine; 2) to create an evaluation system; and 3) to provide a more educational experience for the zoo visitor.
3. Successful implementation of the enrichment program is dependent upon keeper participation.
4. Enrichment can be evaluated on many different levels from simple check sheets to formal research projects.
5. Enrichment can be used as an educational tool. Educating educators about enrichment helps them incorporate enrichment into their many programs.

(Editor's note: This article originally appeared in the 1993 Conference Proceedings from Atlanta. With the upsurge in interest in environmental enrichment for captive animals, it is being reprinted here in hopes of reaching a wider audience.)



Naturalistic Enrichment Ideas Sought

We're interested in any suggestions for "naturalistic" enrichment options for Polar Bears and California Sea Lions. We are primarily interested in novel manipulable objects (i.e. non-food directed ideas) that will blend in well with a grey rock/water environment. Note that both exhibits have large underwater viewing windows which may sustain scratches or damage from large objects. Please include design plans and methods for attachment if applicable. Please send to: Rocky Coast Keepers, North Carolina Zoo, 4401 Zoo Parkway, Asheboro, NC 27203 (910) 879-7657; FAX (910) 879-2891.

AZA 1995 Regional Conferences

AZA Great Lakes Regional (March 12-14, 1995) - For further information, contact Sandy Allen, Louisville Zoo, P.O. Box 37250, Louisville, KY 40233 (502) 451-0440, ext. 608.

AZA Central Regional (March 26-28, 1995) - For further information, contact Dawn McDonough, Sedgwick County Zoo, 5555 Zoo Blvd., Wichita, KS 67212 (316) 942-2213.

AZA Southern Regional (April 9-11, 1995) - For further information, contact Harriet James, Jackson Zoo, 2918 West Capitol St., Jackson, MS 39209 (601) 352-2585.

AZA Western Regional (April 23-25, 1995) - For further information, contact Rich Hendron, Utah's Hogle Zoo, P.O. Box 58475, Salt Lake City, UT 84108 (801) 582-1632.

AZA Northeast Regional (May 7-9, 1995) - For further information, contact Glenda Nelson, Virginia Zoo, 3500 Granby St., Norfolk, VA 23504 (804) 624-9937.





PAAZAB

PAN AFRICAN ASSOCIATION OF ZOOLOGICAL GARDENS
AQUARIA AND BOTANICAL GARDENS

The "Pan African Association of Zoological Gardens, Aquaria, and Botanical Gardens (PAAZAB) was formed in 1989 and formalized in 1990. It is an Africa-wide voluntary association not for gain, initiated in South Africa.

Its purpose is to "...coordinate, represent and promote the interests of zoos, aquaria and botanical gardens at the national and international level". It is a regional member of the World Zoo Organization, otherwise known as the International Union of Directors of Zoological Gardens (IUDZG), and of the Captive Breeding Specialist Group (CBSG) of the World Conservation Union (IUCN). It has also recently been recognized by the American Zoo and Aquarium Association (AZA), whose 125 North American members hosted between them 105 million visitors in 1991, or one of every three persons in the U.S. and Canada. In 1991 PAAZAB was awarded the Chicago Zoological Society's "International Zoological Achievement" award.

PAAZAB's membership has grown steadily since its launch in 1990. Full membership is limited to permanent establishments open to and administered for the public to promote education, recreation and cultural enjoyment through the exhibition, research, conservation and preservation of animals and plants. Twenty-one institutions from ten African States (Cameroon, Ivory Coast, Madagascar, Malawi, Mocambique, Morocco, Namibia, South Africa, Zaire, and Zimbabwe) presently make up PAAZAB's full members. Fourteen associate members and 200 individual members from the USA, Canada, Zaire, Malawi, South Africa, France, Madagascar, Senegal, Tunisia, Algeria, and Egypt make up the balance of membership.

Individual membership of PAAZAB is open to any interested person. A PAAZAB Bulletin is now produced twice annually, with news about its members and the zoo/aquaria business in general in Africa.

PAAZAB "African ZooHelp" Fund

Humans throughout Africa have been migrating towards towns and cities by the millions. Perhaps as much as 60-70% of sub-Saharan Africa's human population is now urbanized, living mainly under poor and squalid conditions. Civil wars, economic failures, and natural disasters have been driving this.

For these tens of millions of Africans struggling to survive, nature and wildlife is irrelevant to their day-to-day lives. Africa's urban majority, its people of tomorrow, have almost no value for it. The only opportunity they have to experience it in their own personal lives is to visit a local, affordable and accessible zoo or aquarium. Such facilities have an enormous and crucial role to play in reawakening a sense of value for wildlife in the social and cultural fabric of society, if Africa's rich and special wildlife is to survive its present journey toward marginalization.

The PAAZAB's "African ZooHelp" fund has been established to provide training to African zoos in management, marketing, education, and in proper animal care and husbandry. Such expertise is available from larger and more established zoos/aquaria in Africa, but the funding required for this needs to be provided externally. The focus is not on evacuating zoo animals to other places, but rather to provide training to improve, stabilize, and advance African zoos so that they can effectively and ethically fulfill the above roles. Evacuation is a last resort only.

For more information on "African ZooHelp" or membership information contact: PAAZAB ZooHelp, P.O. Box 87692, Houghton 2041, South Africa (Tel: (011) 646-2000).



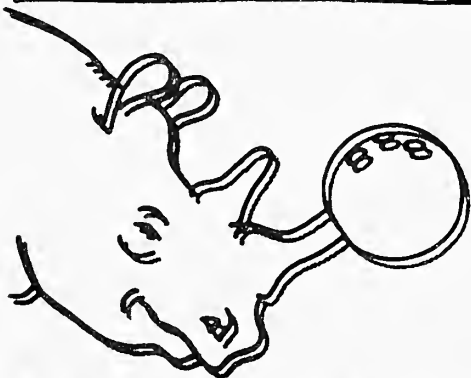
Chapter News

Greater Houston Chapter

The Greater Houston Chapter of AAZK is offering its 1994 Bowling for Rhinos T-Shirt for \$12.00 (price includes S/H) while supplies last. The shirts are Hanes Beefy-T preshrunk 100% cotton, cream color with one of the national BFR logos on the pocket and our local logo across the back (see logos below). Sizes available are mostly Large and X/Large.



B O W L I N G



F O R R H I N O S

June 18, 1994

To order, send name, complete mailing address and your check or money order made out to the Greater Houston Chapter of AAZK. Send to Greater Houston Chapter AAZK, Houston Zoo, 1513 North MacGregor, Houston, TX 77030. U.S. FUNDS ONLY. Please allow two weeks for domestic delivery.

South Florida Chapter

In October we held our 1st Annual Wildlife Art and Awareness Weekend which was very successful. We raised about \$1200.00. We had 18 artists display and sell their work and local wildlife organizations had animal displays and information for the public. The AAZK booth had art work done by keepers as well as T-shirts and a very popular bake sale. Everyone enjoyed the festival and we have a lot of people interested in participating and helping next year.

Our last event of the year, our annual banquet, was also a success with close to 100 people attending a night that included dinner, dancing and a raffle and silent auction that raised close to \$1500.00.

Last but not least, we will send a donation to the WOLF FUND in memory of David Marshall, a co-worker and friend whom we lost this year but will not forget.

--Pat Monseur, 1994 Secretary

San Diego Chapter AAZK

Hope everyone had a great holiday season. Our monthly speaker for December was Amy Bevis from the Dian Fossey Foundation. She talked about her gorilla research and the tragic civil war in Rwanda that left her fleeing for her life. She was heading back there soon after our December 2 meeting.

We helped her raise some money for her Rwanda refugee fund. These are the people who help protect the gorillas. Anyone else interested in helping her cause, may contact the AAZK San Diego Chapter, P.O. Box 551, San Diego Zoo, San Diego, CA 92112.

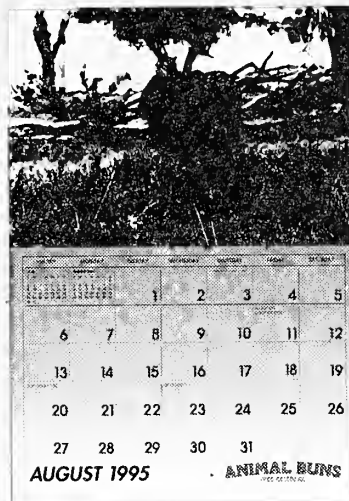
We now have the remaining 1995 Animal Buns Calendars for a wholesale cost of \$5.38 plus shipping (\$3.50). We once again want to thank everyone for their support. We hope that those Chapters who bought bulk orders were able to raise some money for themselves. Some of the proceeds have gone to buy a Zoo Infant Development Notebook for the San Diego Wild Animal Park. We are waiting until the first of the year to begin reviewing the proposals for conservation projects.

Chapter News, Continued

Calendar orders may be sent to: San Diego AAZK at the address above. Please note that for individual retail orders the price is \$11.95 per unit. The price was incorrectly listed in the December AKF as \$22.95.

We will be holding elections this month for new Chapter officers. We want to wish everyone the best in the New Year.

--Nicki McGahey, President



Information Urgently Needed

The Columbus Zoo would like information regarding twin births in Chimpanzees (*Pan troglodytes*). We would appreciate any information that could be shared on the following:

- Was it determined prior to birth that she was carrying twins? How?
- Any special preparations prior to birth that were made?
- Was the birth photographed/video recorded?
- What type of observations were done?
- Any problems that occurred during the labor/birth?
- Was the mother given the opportunity to raise both? If so, how did she manage?
- If one or both of the infants were pulled for hand-rearing, please describe how and why the decision was arrived at.
- Any other group members that were present at birth, their behaviors and interactions with the mother and infant.

Any other information that you feel is pertinent to the birth and after care please send to: Dianna Frisch, Columbus Zoo, P.O. Box 400, 9990 Riverside Dr., Powell, OH 43065.



Need to Reach AAZK?

1-800-242-4519 (U.S.)

1-800-468-1966 (Canada)

FAX: (913) 273-1980

or write

**AAZK, Inc.
635 S.W. Gage Blvd.
Topeka, KS 66606-2066**

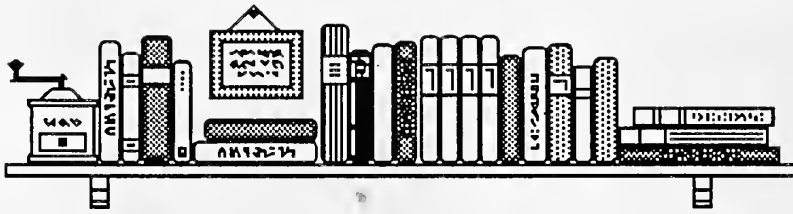


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Book Reviews

The Natural History of Weasels and Stoats

By Carolyn King
Cornell University Press, 1989
124 Roberts Place, Ithaca, NY 14850
253 pgs. Hardback

Review by Larry Newman
Biologist-Mammals
National Zoological Park
Washington, DC

In her aptly titled book, The Natural History of Weasels and Stoats, Carolyn King presents a comprehensive summary of the biology of the smallest members of the family Mustelidae, collectively known as weasels. King draws upon over 20 years of personal observation and research on this fascinating group of carnivores, as well as pulls together scientific data and anecdotal accounts from sources throughout the extensive range of this group of Northern Hemisphere Mustelids.

The subject of King's book, the three species of *Mustela* common throughout the northern temperate and boreal zones - *M. nivalis*, *M. erminea*, and *M. freneta*, are known colloquially as the common or least weasel; ermine, stoat, or short-tailed weasel; and the long-tailed weasel.

King begins with a detailed description of the weasels and attempts to dispel many of the myths which have led to the weasels being labeled as vermin. King reveals her adoration of the weasels as she describes them as "hair-trigger mouse traps with teeth...They are carnivores, among the purest of the type: they are perfectly adapted in every feature of their body and behaviour to live exclusively as hunters."

King traces the ancestry of the weasels from the Pleistocene, elaborating on their ability to enter the burrows of small rodents as the key to their collective success. Discussions of the evolution of body size offer some intriguing insights into the mechanisms involved. Detailed descriptions of the process of moulting and winter whitening, anatomy, and the complicated reproductive system provide a comprehensive summary of the physiology of this uniquely adapted carnivore.

A substantial portion of the book is devoted to hunting behavior and the close ties that the weasels have with the local population of rodents. Impacts on prey populations, home range size, and the adaptability to changing habitats are discussed. The dynamics of population density are also analyzed.

In a particularly interesting chapter, King examines the "puzzles" of delayed implantations, sexual dimorphism, and co-existence amongst related species. In light of the total suite of adaptations of the weasels, which are largely related to the advantages and disadvantages of their diminutive size, King offers theories to explain these enigmatic adaptations.

In the final chapter, King discusses the interaction between weasels and man. Then she explains why attempts to intervene and control both populations of prey with weasels, and populations of weasels (considered as pests of game birds) have inevitably failed.

King's comprehensive treatment of the biology of the weasels is well-organized and written in a fashion that will hold the interest of the lay reader as well as the professional biologist.

Book Reviews, Continued

Tracking the Vanishing Frog: An Ecological Mystery

By Katheryn Phillips
St. Martin's Press, New York, NY 1994
Hardcover. \$22.95 US; \$31.99 Canadian

Review by Alycin Hayes
Director, Echo Hill Farm
Ontario, Canada

We have all heard about the disappearance of various species of frogs in recent years. The most publicized is the Golden toad (*Bufo periglenes*) of Monteverde, also known as "the miner's canary?"

Katheryn Phillips, a journalist, spent three years following herpetologists who were doing research concerning amphibian disappearances. She followed scientists such as Marc Hayes and Mark Jennings knee-deep into swamps, during their field work on the California red-legged frogs (*Rana aurora draytonii*), a species of frog that was once extremely common in California. She traveled thousands of miles to get information for this book, also studying people like Martha Crump and her work in Costa Rica with the Golden toad.

Tracking the Vanishing Frogs covers numerous potential reasons for amphibian disappearances throughout the world. She explores theories on global warming, habitat fragmentation and destruction, climatic changes, acid rain, spread of exotic (introduced) species, UV over-exposure, pet trade, parasites and human consumption of frogs, etc.

It is not a dry scientific book, but rather an up-to-date, entertaining read. For example, while she explains how humans have historically exploited frogs she describes the danger of eating too many frog legs. "In the late nineteenth century, French doctors reported two separate cases of priapism among soldiers who were stationed in North Africa. Priapism is the rather embarrassing condition of having a prolonged and painful erection unassociated with erotic pleasure. The French doctors noted that in both cases the soldiers had eaten frog legs..the doctors found the Spanish Fly beetle in the gut of local frogs."

Aside from such anecdotal humor, she writes with a refreshingly objective point of view, concerning the serious and frightening losses of our amphibians. Tracking the Vanishing Frog, concludes with an extensive bibliography of books, special publications and journals on the topic. Her book does not try to solve the problem of the vanishing frog, or even give any easy explanations, but rather gives the reader an informative, highly readable essay that would appeal to anyone interested in herpetology or the conservation of our planet as we know it.

Mammals from Pouches and Eggs

Edited by Jennifer A. Marshall Graves,
Rory M. Hope and Desmond W. Cooper
Reprinted from Australian Journal of Zoology
Vol. 37, Numbers 2, 3, 4 (1990) - 337 pgs.
CSIRO, Educational Services Unit, Melbourne

Review by Elaine Kirchner
Zoologist I
Ft. Wayne Children's Zoo
Ft. Wayne, IN

The book is subtitled "Genetics, Breeding and Evolution of Marsupials and Monotremes". Most of the papers deal with topics considered at the Boden Research Conference held in Thredbo in February 1988. All the papers are rather technical in nature, but do provide important information. Perhaps the greatest value can be found in the extensive bibliographies which accompany each paper. Anyone wishing to research the latest topics should find these references invaluable. While I don't recommend this as light reading, it would be a valuable asset to those serious about researching Australian animals.



Ivory Seizure in Zambia a Breakthrough in Cracking Illegal Trade Rings

Paul Russell, executant of World Wildlife Fund's project to support the Species Protection Department (SPD) of Zambia's Anti-Corruption Commission, reports that the SPD was involved in the 25 July arrest of three people who were transporting 216 elephant tusks from Western Province to Lusaka in an army vehicle.

Two days later, officers from SPD, the National Parks and Wildlife Service, and honorary wildlife police raided a house in Lusaka and arrested Henry Mubiana, a businessman who admitted buying the ivory, worth more than US\$45,000, from dealers in Western Province.

Mubiana confirms that all the ivory - weighing a record total 940 kilograms - came from Angola and was destined for Malawi, a sign that Zambia is a transit point for an inter-country poaching network. A total of four people have been arrested in the case so far. SPD is now looking for a fifth person in the chain.

In August, another joint operation led to the recovery of six tusks weighing 54.5 kilograms and an AK47 assault rifle. Three people were arrested and SPD is looking for two others involved. Greed is not the reason so much ivory is coming out of Angola. Nineteen years of civil unrest are taking their toll on humans and wildlife: about a thousand people die of hunger each week. Civilians are becoming so desperate for food that they buy weapons from UNITA soldiers - who are themselves after elephants - shoot elephants, and trade ivory for food in neighboring Zambia.

Meanwhile, poaching has decimated Zambia's own elephant population. Numbers have dropped from 24,000 to 10,000 in the past two years.

"The seizure is a real breakthrough," says Russell. SPD is now working with other government departments on further investigations in the region - especially South Africa.

This year WWF is spending more than US\$2 million on a wide range of African elephant conservation work, such as project 9F0062:African Elephant Emergency Fund.

The Zambian ivory seizure proves that elephant poaching and the ivory trade continue. To continue fighting the problem, this past November WWF was at the 1994 CITES conference in Ft Lauderdale, Florida. CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora - is an important conservation agreement, and a key instrument in elephant protection. It prohibits international commercial trade in endangered species (listed on CITES' Appendix I) and regulates trade in less-threatened species (listed in Appendix II). In 1989, CITES put elephants on Appendix I, banning all trade in ivory. WWF, which supported this move, remains committed to the ivory ban.

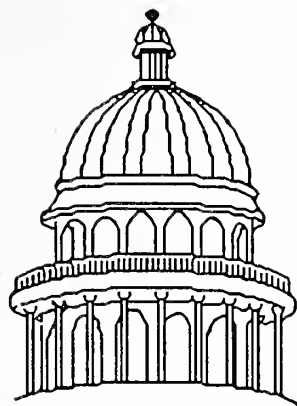
To keep its elephant population stable at 7,500, South Africa culls up to 400 animals a year. At CITES this year, the country, which has less than 1 per cent of the continent's elephants, announced it would like to export accumulated hides and use the proceeds for elephant conservation. WWF believed this proposal could have strengthened elephant protection: South Africa, which exempted itself from the ivory ban by entering a "reservation" (ivory carvings are on sale in Johannesburg airport), said it would accept the ban if its proposal passed. After vigorous debate spearheaded by the U.S., the proposal was withdrawn.

--- from WWF News (ISSN 0254-3893), published quarterly by the International Secretariat of WWF-World Wide Fund For Nature. Copyright ©1994 by WWF-World Wide Fund For Nature (also known as World Wildlife Fund in the US & Canada).



Legislative Outlook

Compiled by
Phyllis Nilson-Wojcik
Legislative Advisor



Rhino and Tiger Conservation Fund Signed Into Law

After receiving recommendation from the Merchant Marine & Fisheries Committee of the U.S. House of Representatives, H.R. 4924 (Rhino and Tiger Conservation Fund) was approved by both houses of Congress and signed into law by President Clinton in October. The Fund established by legislation could receive as much as \$10 million per year. The money would be allocated to conservation projects of nations whose activities directly or indirectly affect rhino and tiger populations.

USDI Secretary Bruce Babbitt announced that the U.S. would immediately make \$100,000 available to the rhino and tiger fund. This money would come from other programs within the USDI budget during the current fiscal year. U.S. officials said the World Wildlife Fund-U.S. was committed to contributing an additional \$100,000 to the fund as well.

The "Rhino and Tiger Conservation Act" marks the third time in recent years that the U.S. has established an account to aid specific species. In 1988, legislation was enacted to establish funding for African elephant conservation projects. To date, more than \$3 million has been spent on 41 projects in 13 countries. In 1993, the U.S. established a fund for wild bird conservation projects, but no money has been made available yet.

>Excerpted from African Wildlife Update, Vol. 3, No. 6, Nov-Dec 1994 from African Wildlife News Service, P.O. Box 546, Olympia, WA 98507-0546

CITES Meeting Draws 118 Nations

Delegates from 118 nations gathered in Fort Lauderdale, FL in November for the biennial meeting of the parties to CITES, the Convention on International Trade in Endangered Species. More than 1600 people gathered for the two-week session to discuss a wide range of wildlife trade and conservation issues.

The following touches on some of the main outcomes of the meeting:

- The proposal by South Africa to transfer its population of African elephants from Appendix I to Appendix II for trade in "commodities other than ivory" was withdrawn. They had been seeking approval to sell hides and meat from the hundreds of elephants culled annually in Kruger National Park.
- The Sudan's proposal to transfer its population of African elephants from Appendix I to Appendix II for the purpose of exporting a stockpile of 10,884 tusks during 1995 was withdrawn. While acknowledging that its proposal did not meet the biological criteria established by CITES for the downlisting of elephant populations, the Sudan delegation said its intent in offering the proposal was to have the Parties address "the forgotten issue of stockpiled ivory in Africa".

Legislative Update, *Continued*

- The proposal by South Africa to transfer its population of Southern White Rhino (*Ceratotherium simum simum*) from Appendix I to Appendix II was approved in amended form by a vote of 66-2. South Africa amended its proposal so that only the "sale of live animals to appropriate and acceptable destinations and hunting trophies" would be allowed. The original proposal would have allowed trade in perishable white rhino products (such as hides) as well.
- Benin, Belgium and France proposed the inclusion of the Common hippopotamus (*Hippopotamus amphibius*) in Appendix II because trade in its ivory teeth appears to have grown in recent years. Botswana, Namibia and Zimbabwe sought to have their hippo populations excluded from the listing, but proponents were unwilling to amend the proposal. TRAFFIC expressed concern that a split-listing would create enforcement problems. Approval came on a 70-2 vote. About 160,000 hippos remain in Africa.

The Conference also adopted resolutions calling for continued efforts to protect endangered rhinos. Parties agreed to increase efforts to educate people and discourage the use of products made from rhinos. Consumer countries - including China and Korea - agreed to work with physicians and pharmaceutical companies in the search for alternative medicines that do not use rhino parts.

>Excerpted from African Wildlife Update, Vol. 3, No. 6, Nov-Dec 1994 from African , Wildlife News Service, P.O. Box 546, Olympia, WA 98507-0546



Wild Bird Conservation Act Updates

The finalization of the approved captive-bred species list, allowing importation of 45 exotic species and color mutations of three captive-bred species without a WBCA permit went into effect on 3 January 1995. Other necessary requirements continue to apply, however, such as permits or documents required by CITES, other federal laws, and the exporting country. This approved list of captive-bred species does not regulate the breeding, selling, transport, interstate commerce, or export of birds bred in the United States.

>CITES UPDATE #31, December 1994, U.S. Department of the Interior

Endangered Species Act Update

Creation of a stronger, more ecosystem-based ESA, overdue for reauthorization, may be put on hold for an even longer period of time. Due to the elections held in November, some environmental groups fear pushing for a revised version of a reauthorized ESA may actually result in a weakened ESA. The ESA is automatically reauthorized in its present state but for revisions it must be debated in the House and Senate.



Tiger Aid Redoubled: Global Tiger Forum Established

By Lesa Griffith

With extinction staring tigers in the face, in March experts from around the world founded the Global Tiger Forum in New Delhi, India. In August, WWF accepted an invitation to become a member. "This forum is the first formal platform for all institutions concerned with tiger conservation, and shows that, as with whales, rhinos, and the African elephant, tigers are an international issue," says Chris Hails, director of WWF International's Asia/Pacific Programme.

The Global Tiger Forum's goal: to save the tiger by promoting an international awareness campaign, working to end the trade in tiger products, increasing the network of protected tiger areas, among other things.

Forum members include 11 of the 14 countries that still have tigers - Bangladesh, Bhutan, Cambodia, Indonesia, India, Malaysia, Burma, Nepal, Russia, Thailand, and Vietnam - other countries who want to help tigers, and non-governmental organizations such as WWF.

It's not so much fur trade that spurs tiger poaching. Bones, penises, and other tiger parts are top ingredients for Oriental traditional medicine, particularly in China, Taiwan, and South Korea. A tiger is worth more dead than alive: in South Korea the bones of a single tiger are worth US\$20,000. Habitat destruction is another threat. The spread of human and livestock populations, commercial logging, and agriculture are squeezing tigers into smaller and smaller spaces.

WWF has been helping in the fight to save the tiger since 1972, when it launched its Operation Tiger campaign. The next year WWF donated US\$1 million to India's Project Tiger. More recently, in March of 1994, Robin Pellew, the chief executive of WWF-UK, on behalf of the WWF Network, pledged US\$100,000 to the new Indian National Tiger Action Plan. WWF works to conserve tiger habitats such as Kerinci-Seblat National Park in Indonesia and Nepal's Royal Bardia National Park.

Through these projects, WWF has learned that the wildlife trade is stronger than park guards and fences. To get beyond the symptoms to the cause, TRAFFIC, WWF's wildlife trade monitoring arm, is researching the feasibility of public awareness campaigns in tiger-consuming countries such as South Korea. And WWF is supporting a project to study the tiger bone and rhino horn trade. The results will be used to try to ease the market shut. Just published is WWF's new 1994 Species Status Report, "Wanted Alive: Tigers in the Wild".

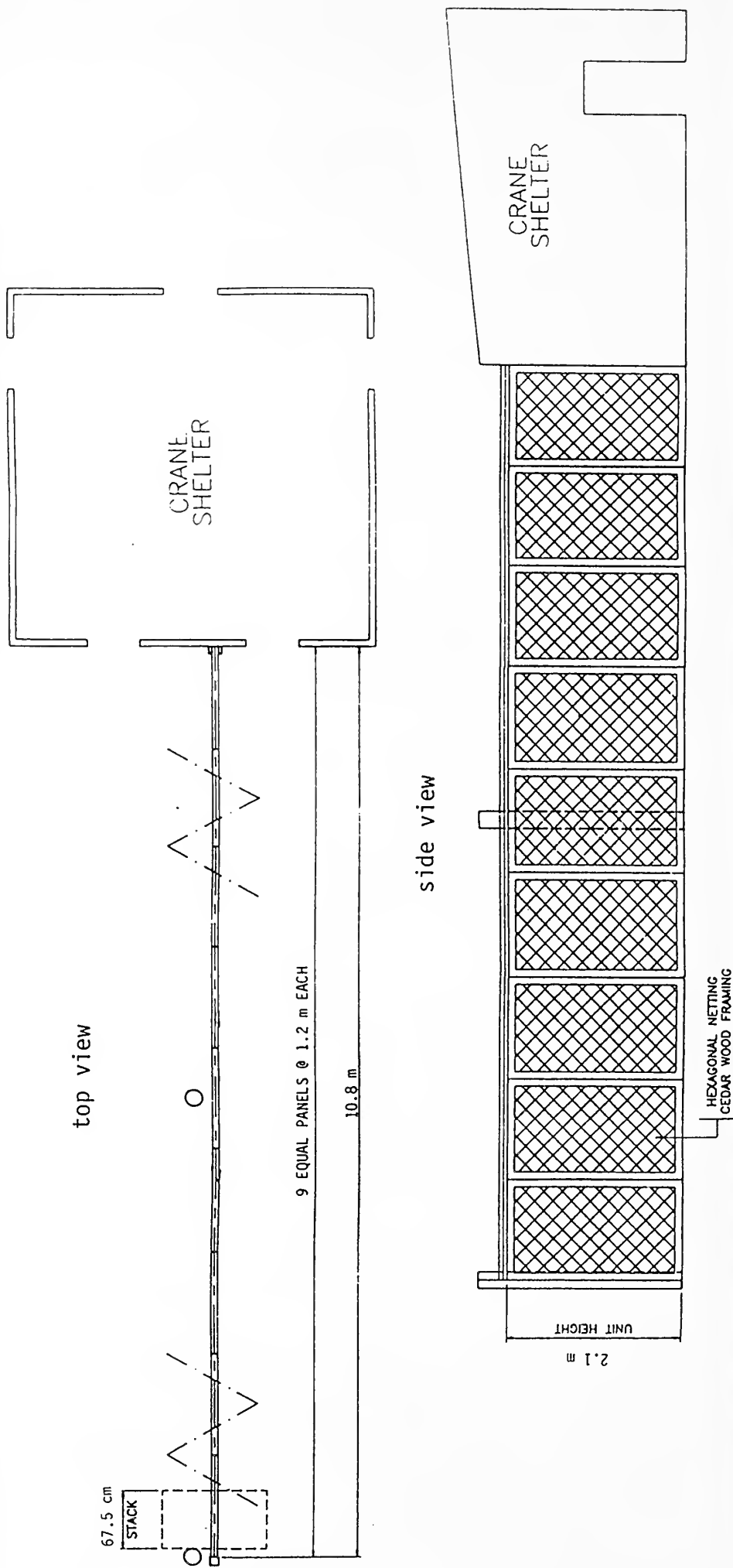
--- from *WWF News* (ISSN 0254-3893), published quarterly by the International Secretariat of WWF-World Wide Fund For Nature. Copyright ©1993 by WWF-World Wide Fund For Nature (also known as World Wildlife Fund in the US & Canada).



Socialization Pen for Crane Pairing

submitted by Nancy K. Businga, Veterinary Technician
International Crane Foundation, Baraboo, WI

Cranes are socialized with potential mates by introducing the more dominant bird (generally the male) into the pen of the less dominant bird. Shifting birds from one pen to another can be hazardous to both the birds and to aviculturists. A special socialization pen was created from two existing, adjacent pens by replacing the stationary divider fence with a sliding collapsible partition. The partition consists of nine (9) panels. The three (3) center panels are stationary with one constructed for use as a door. The three (3) on each end slide along a grooved frame and fold together like an accordion (see diagram). The larger open area gives the birds more space and freedom to shift together on their own, both of which reduce stress during socialization periods.



L.I.N.K.
(Liaison and Information Network for Keepers)

Coordinator for the LINK System: Mark de Denus, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba, Canada R3P 0R5. (204) 986-6921 [w]; (204) 837-2916 [h]. Assistant LINK Coordinator - Ric Urban, Houston Zoological Gardens, Houston, TX, 1513 MacGregor Way, Houston, TX 77030 (713) 520-3234 [w].

Regional Coordinators

ALABAMA - Fred Alvey, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315
ALASKA - Vacancy
ARIZONA - Vacancy
ARKANSAS - Debbie Jackson or Ann Rademacher, Little Rock Zoological Gardens,
#1 Jonesboro Dr., Little Rock, AR 72205
CALIFORNIA (Northern) - Jean Lai, Oakland Zoo, 9777 Golf Links Rd., Oakland, CA 94605 and
Ruby Lara, Sacramento Zoo, 3930 West Land Park Dr., Sacramento, CA 95822-1123
CALIFORNIA (Southern) - Vacancy
COLORADO - Vacancy
CONNECTICUT - Jeanette Nadeau, Roger Williams Park Zoo, Providence, RI 02905
DELEWARE - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA 19104
FLORIDA - Rick Smith, 5752 Stoneridge, Orlando, FL 32839
GEORGIA - Fred Alvey, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315
HAWAII - Vacancy
IDAHO - Holly Liappas, Tautphaus Park Zoo, P.O. Box 50220, Idaho Falls, ID 83405
ILLINOIS - Pat Swieca, 5710 W. Cullom Ave., Chicago, IL 60634
INDIANA - Jan Weinig, P.O. Box 197, Michigan City, IN 46360
IOWA - Carla Wieser, Omaha's Henry Doorly Zoo, 10th St. & Deer Park Blvd., Omaha, NE 68107
KANSAS - Vacancy
KENTUCKY - Scott Wright, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109
LOUISIANA - Rhonda Votino, 3535 Houma Blvd., Apt. 109, Metairie, LA 70006
MAINE - Jeanette Nadeau (see addresses under CT)
MARYLAND - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA
MASSACHUSETTS - Jeanette Nadeau (see addresses under CT)
MICHIGAN - Tim Sampson, John Ball Zoo, 1300 W. Fulton, Grand Rapids, MI 49504
MINNESOTA - Tim Hill, Minnesota Zoological Gardens, 13000 Zoo Blvd., Apple Valley, MN 55124
MISSISSIPPI - Jeannie Frazier, Jackson Zoological Park, 2918 W. Capitol, Jackson, MS 39209
MISSOURI - Vacancy
MONTANA - Holly Liappas (see address under Idaho)
NEBRASKA - Carla Wieser (see address under Iowa)
NEVADA - Patricia Simonet, Wildlife Safaris, P.O. Box 6735, Incline Village, NV 89450
NEW HAMPSHIRE - Jeanette Nadeau (see addresses under CT)
NEW JERSEY - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460
NEW MEXICO - Vacancy
EAST NEW YORK - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460
WEST NEW YORK - Alan Baker, Burnet Park Zoo, 500 Burnet Park Dr., Syracuse, NY 13204
NORTH CAROLINA - Lucy Segerson, North Carolina Zoo, Rt. 4, Box 83, Asheboro, NC 27203
NORTH DAKOTA - Bob Debets, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba
Canada R3P 0R5 (204) 986-6921 [w]
OHIO - Scott Wright, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109
OKLAHOMA - Debbie Jackson or Ann Rademacher (see addresses under AR)
OREGON - Anna Michel, Washington Park Zoo, 4001 SW Canyon Rd., Portland, OR 97221
PENNSYLVANIA - Theresa Maas, Philadelphia Zoo, 3400 W. Girard, Philadelphia, PA 19104
RHODE ISLAND - Jeanette Nadeau (see addresses under CT)
SOUTH CAROLINA - Lucy Segerson, North Carolina Zoo, Rt. 4, Box 83, Asheboro, NC 27203
SOUTH DAKOTA - Bob Debets (see address under ND)
TENNESSEE - Gail Karr or Cindy Finger, Memphis Zoo & Aquarium, 2000 Galloway, Memphis, TN 38112
TEXAS - Connie Dieringer, Caldwell Zoo, P.O. Box 4280, Tyler, TX 75712
UTAH - Vacancy
VERMONT - Jeanette Nadeau (see addresses under CT)
VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104
WASHINGTON - Vacancy
WEST VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104
WISCONSIN - Wayne Hazlett, 3768 S. 89th St., Milwaukee, WI 53228
WYOMING - Holly Liappas (see address under Idaho)
DISTRICT OF COLUMBIA - Theresa Maas (see address under PA)
Province of Ontario - Vacancy
Provinces of Manitoba & Saskatchewan - Bob Debets (see address under ND)
Province of Quebec - Vacancy
Provinces of Alberta & British Columbia - Grant Tkachuk, 10139 157th St., #206, Edmonton, Alberta T5P 2T9
Atlantic Canada - Bernard Gallant, RR # 7, 1081 Ryan Road, Moncton, N.B., E1C 8Z4

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKF, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is 913-273-1980.

CHIMPANZEE CAREGIVER...two (2) full-time positions open. Requires two years of college level course work, two years experience in the care of exotic animals; OR an equivalent combination of experience which provides the required knowledge, skills and ability. Primate experience a plus. Assist in the responsibility of caring for approximately 80 chimpanzees (*Pan troglodytes*) in a breeding colony. Must be willing to make at least a two-year commitment. Excellent benefits. EOE. Applicants must have a negative TB skin test, negative hepatitis B surface antigen test and evidence of a measles booster or natural disease prior to employment. Send letter of interest (with requested salary), resumé, and three (3) letters of reference to: Jo Fritz, Director, Primate Foundation of Arizona, P.O. Box 20027, Mesa, AZ 85277-0027. Positions open until filled.

INTERNSHIP...the Miami Valley Serpentarium, a nonprofit organization, is seeking a student intern for the 1995 spring, fall and summer season. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. Intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions to the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition, intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern will **not be involved** in the handling of venomous reptiles. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis; ability to communicate effectively with people; writing skills; orientation to details; and self-motivation. Students majoring in the biological or natural sciences are preferred. Former interns have arranged for academic credit with their colleges and universities. Salary and benefits include experience with the most extensive and diverse collection of snakes in the area, housing, and \$55/week in pay. Personal transportation recommended. Starting dates are flexible, but a minimum commitment of three months covering SPRING (March-May) or SUMMER (June-Aug.) or FALL (Sept. - Nov.) is required. To apply send a cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo, 1275 Natural Bridge Road, Slade, KY 49376. Deadlines for applications: Spring - **21 January, 1995**; Summer - **20 March, 1995**; Fall - **15 June, 1995**.

ZOOKEEPER...seeking individual with a Bachelor of Sciences in biology, zoology, or related field and/or two (2) years paid experience in a zoo or animal park. The successful applicant will work on a rotating shift that involves the daily husbandry of felines, primates, ungulates, and small mammals. Applicant shall be a self-motivated team player. An interest in enrichment is necessary as applicant shall have one work day devoted to design and implementation of enhancement options. Submit resumé to: Personnel Manager, Caribbean Gardens, P.O. Box 7129, Naples, FL 33941.

ELEPHANT/GENERAL ZOOKEEPER...requires previous experience with elephants in free contact. Biology/related degree preferable. Responsible for care, feeding, health/safety of animals, exhibit maintenance, supportive public relations. Benefits. Send resumé and references to: Julia Parker, Animal Care Supervisor, 500 Ninos Dr., Santa Barbara, CA 93103 (Santa Barbara Zoo).

VETERINARY TECHNICIAN/HOSPITAL KEEPER...the Gladys Porter Zoo is seeking qualified applicants for a full-time veterinary technician/hospital keeper position. Job responsibilities include, but are not limited to: weekend and relief hospital keeper duties (cleaning, feeding, treatments, etc.), weekend and relief technician duties (clinical pathology, assisting with all procedures, radiology, etc.), MedARKS data entry and maintenance of medical records. Prior technician experience and working knowledge of MedARKS preferred. Wage in the mid-teens, plus benefits. Send resumé **by 20 January 1995** to: Teri Hermann, RVT, Gladys Porter Zoo, 500 Ringgold St., Brownsville, TX 78520.

Opportunity Knocks, Continued

CAMP SEA WORLD INTERNSHIP PROGRAM...Sea World of Florida is recruiting motivated college juniors and seniors seeking degrees in science education, elementary education, natural sciences, or recreation for a paid internship with the Education Department. Interns will assist Camp Sea World instructors with every aspect of camp operations, from preparing class materials to implementing games and activities. Students can arrange to receive academic credit and are responsible for transportation and housing. Applicants must be available from 22 May through 11 August 1995. Application deadline is **28 February 1995**. For application information, contact: Judy Jenkins, Education Dept., Sea World of Florida, 7007 Sea World Drive, Orlando, FL 32821-8097. Tel: (407) 363-2393; FAX: (407) 363-2399.

ZOOKEEPER/BIRDS...degrees in biological sciences preferred or equivalent training and experience in zoo or related field. Must be able to work with a wide variety of animals,, bird experience preferred. Salary \$16,700.00 or commensurate with experience and a full benefits package. Send letter and resumé by **23 December 1994** to: Ms. Kyle McNeil, Human Resources, Dreher Park Zoo, 1301 Summit Blvd., Westg Palm Beach, FL 33405-2098.



Are Frogs and Toads Disappearing With the Ozone?



Damage to the Earth's ozone layer may be causing a drop in the populations of many species of frogs and other amphibians. If confirmed, the findings mark the first time the loss of ozone has been found to affect higher animals and the first time measurable impacts have been shown in middle latitudes.

Researchers at Oregon State University, noting that erosion of the ozone layer lets more ultraviolet radiation penetrate the atmosphere, said the increase of UV rays is hampering the amphibians' ability to reproduce. For the last six years, zoologists around the world have been reporting an unexpectedly rapid decline in some populations of frogs, toads, salamanders and other amphibians. Not all species have declined, but the reduction - and in some cases the apparent extinction of whole species - has rung a warning bell that something may be seriously amiss in the environment.

Not everyone is convinced that ozone loss is to blame, however. An amphibian expert from Harvard says the jury is still out on amphibian decline. He says it may be a combination of factors, or even part of a natural population cycle that will rebound in the future. Nevertheless, scientific reports of worldwide amphibian decline continue to worry researchers. *Philadelphia Inquirer via Nature News*, Vol. 10. No. 10. *The Nature Book Society*.



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symbols used with page numbers mean:

(?) - information please
a - acquisition
b - birth
c - chapter news item
co - correction
E - environmental enrichment
h - hatching
hr - hand rearing

i - infant development
K - keeper alert
L - Legislative Outlook
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n - nutrition
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v - veterinary

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**February 1995
Volume Twenty-two
Number Two**

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Zoo Infant Development Project -

Teri Maas/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Kim Livingstone, L.A. Zoo (Passerines)

Jeanne Bocconcelli, Newark Museum Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Grand Rapids, MI

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Information for Contributors

Animal Keepers's Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration.

Articles should be typed or hand-printed and double-spaced. All illustrations, graphs, charts and tables should be clearly marked, in final form, and should fit in a page size **no greater than** 15cm x 25½cm (6" x 10"). Literature used should be cited in the text (Brown, 1986) and alphabetically in final bibliography. Avoid footnotes. Include scientific name of species (as per ISIS) the first time it is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Black and white photos **only** are accepted. Color slides should be converted to black and white prints (minimum size 3" x 5") before submission. Clearly marked captions should accompany photos. Please list photo credit.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone or FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone is (913) 272-5821 Ext. 31. FAX (913) 273-1980.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

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Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$2.00 each.

This month's cover features a De Brazza's Guenon (Cercopithecus neglectus) drawn by Camille Dorian, a keeper at Monkey Jungle in Orinda, CA. Native to the dense, humid forests of the Congo river basin, this primate is medium-sized with fairly long fur which is pearly grey except for the belly, tail and arms, which are black. Its face has a white beard and an orange-red diadem" topped by a black strip. The thighs are marked with black streaks. The DeBrazza's guenon keeps the special coat of its infancy longer than other species. This coat acts as a scent-releaser and causes adults to instinctively adopt a protective attitude toward the young. This plant-eating primate swims well and lives in varying size groups with one dominant male. Breeding takes place year-round. Thanks, Camille!

Scoops

and

Scuttlebutt

San Antonio Chapter Hosts '95 Lone Star Keeper Symposium

The San Antonio Chapter of AAZK, Inc. will host the 1995 Lone Star Keeper Symposium from Friday, 5 May through Sunday, 7 May at the San Antonio Zoo. The Symposium is open to anyone associated with Texas zoos, aquariums and other animal care facilities (i.e., keepers, docents, volunteers, interns, etc.). Registration fee, which includes the cost of food during the Symposium, is only \$25.00. Lodging will be provided by the employees and Docents of the San Antonio Zoo. The Symposium will include both oral presentations and poster sessions. Topics for both include animals husbandry, exhibitry, behavioral and environmental enrichment, conservation, education, etc. For further information, feel free to contact Terry Fisher at (210) 734-7184 Ext. 162, or Kim Hoskins at (210) 734-7184 Ext. 167.

Elephant Training School Scheduled

Riddle's Elephant Breeding Farm and Wildlife Sanctuary will be conducting their Second Annual Comprehensive School in Elephant Training, Handling and Safety Procedures from 5 May through 2 June, 1995. The school, which will be conducted as two, two-week sessions and will cover a variety of elephant management related topics as well as hands-on training, will be taught by Robert "Smokey" Jones. The school will be held at the Sanctuary. If you are interested in receiving registration information, please contact: Riddle's Elephant Breeding Farm and Sanctuary, Attn: Heidi Riddle, Education Coordinator, P. O. Box 715, Greenbrier, AR 72058; phone - (501) 589-3291 FAX - (501) 589-2248.

Enrichment Conference Announced

Spring '95 Species Enrichment Conference will be held in Columbus, OH at the Days Inn North from 6-8 April. Registration fee for this conference, which is being put on by Bio-Tech Environmental, is \$198.00. The conference will offer a blend of education, workshop participation activities, leadership skills, and hands-on tour experience. Registration costs include workshop materials, two breakfasts, two lunches and one dinner. Lodging is the registrant's responsibility. Registration limited to first 30 applicants. For information contact: Bio-Tech Environmental, 7042 Twp. Rd. 15, Centerburg, OH 43011 Attn: Karen Brown, Specialist or call (614) 625-6549 between 9-10 a.m. Mon.-Fri.

AKF Staff Solicits Articles for Second Special Enrichment Issue

The editorial staff of *Animal Keepers' Forum* would like to invite our readers to submit articles on topics relating to behavioral or environmental enrichment for a special dedicated issue planned for May 1995. Submitted material might include full-length articles on enrichment, sketches and drawings illustrating enrichment techniques, brief submissions on enrichment ideas, etc. Enrichment-related material for all animal species is welcome. Deadline for submission of materials for this dedicated issue is **1 April 1995**.

We would also encourage our readers to consider submitting articles for a second dedicated issue on Hand-Rearing tentatively planned for August 1995. We would encourage articles on case studies of hand-rearing (any species), diet information which has proven useful in hand-rearing situations, tips for hand-rearing success, etc. Deadline for submission of materials for the Hand-Rearing issue is **1 July 1995**.

As with past special issues, we depend on our readership to supply adequate materials to make such dedicated issues feasible. If you have questions, please contact the Editor at 1-800-242-4518.

AAZK Grants Available

The American Association of Zoo Keepers, Inc. announces the availability of two \$750.00 research grants in the field of zoo biology. Interested applicants should direct their inquiries to: Sue Barnard, Chairperson, AAZK Research/Grants Committee, Zoo Atlanta, Dept. of Herpetology, 800 Cherokee Ave. S.E., Atlanta, GA 30315. The deadline for submissions is **1 March 1995**.



AAZK Announces New Professional/Contributing Members

Jennifer Lavoie, New England Science Cntr. (MA)	Ivan E. Ives, Franklin Park Zoo (MA)
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ZOOCHECK Canada, Toronto, Ontario, Canada

Neil Colbert, Docent, Bronx Zoo, Bronx, NY

F.O. Wilson Zoo Library, Oklahoma City Zoo, Oklahoma City, OK



Coming Events

13th Annual Symposium of the National Wildlife Rehabilitators Association

March 1-5, 1995

Minneapolis, MN

This educational conference is designed to advance the profession of wildlife rehabilitation and to foster cooperation among various disciplines concerned with wildlife survival and awareness of our environment. For more information contact: NWRA, 14 North 7 Avenue, St. Cloud, MN 56303; phone (612) 259-4086.

Symposium on the Nutrition and Medicine of New World Primates

March 12, 1995

Louisville, KY

Hosted by the New World Primate Taxon Group of AZA. The conference will be held the Sunday before the AZA Mid-Western Regional Conference. The theme will be the medicine and nutrition of New World primates during different life cycles (i.e., pregnancy, lactation, neonatal and geriatric). Speakers will discuss the basic physiological changes as well as management of medical and nutritional diseases that may occur during each life cycle. For further information contact: Dr. Peregrine Wolff, Minnesota Zoological Garden, 13000 Zoo Blvd., Apple Valley, MN 55124 USA; Phone (612) 431-9361, FAX (612) 431-9367.

Joint Conference of the Australasian Regional Association of Zoological Parks and Aquariums (ARAZPA) and the Australasian Society of Zoo Keeping (ASZK)

April 3-7, 1995

Perth, WA

The theme is "Partnerships for Conservation". Will include paper sessions, keynote speakers, and *in-situ* visits to conservation areas. For further information contact: Eveline Read, Conference Coordinator, Perth Zoo, P.O. Box 489, South Perth WA 6151.

AAZV/WDA/AAWV 1995 Joint Conference

August 12-17, 1995

East Lansing, MI

Conference will be held jointly with the American Association of Zoo Veterinarians (AAZV), the Wildlife Disease Association, and the American Association of Wildlife Veterinarians. Program will include paper sessions, workshops, student and graduate competition and poster session. For conference information contact Wilbur Amand, VMD Executive Director, 3400 W. Girard Ave., Philadelphia, PA 19104-1196; phone (215) 387-9094; FAX (215) 387-2165.

AZA 1995 Regional Conferences

AZA Great Lakes Regional (March 12-14, 1995) - For further information, contact Sandy Allen, Louisville Zoo, P.O. Box 37250, Louisville, KY 40233 (502) 451-0440, ext. 608.

AZA Central Regional (March 26-28, 1995) - For further information, contact Dawn McDonough, Sedgwick County Zoo, 5555 Zoo Blvd., Wichita, KS 67212 (316) 942-2213.

AZA Southern Regional (April 9-11, 1995) - For further information, contact Harriet James, Jackson Zoo, 2918 West Capitol St., Jackson, MS 39209 (601) 352-2585.

AZA Western Regional (April 23-25, 1995) - For further information, contact Rich Hendron, Utah's Hogle Zoo, P.O. Box 58475, Salt Lake City, UT 84108 (801) 582-1632.

AZA Northeast Regional (May 7-9, 1995) - For further information, contact Glenda Nelson, Virginia Zoo, 3500 Granby St., Norfolk, VA 23504 (804) 624-9937.



Births & Hatchings



Denver Zoo (Denver, CO)...announces the following significant B&H from September through December 1994:

Mammals - 1.0 Bongo (*Tragelaphus eurycerus isaaci*) DNS [CITES III]; 1.0 Grevy's zebra (*Equus grevyi*) [CITES I, E/SSP]; 0.0.1 Golden lion tamarin (*Leontopithecus rosalia rosalia*) [CITES I, E/SSP] [Both parents were imported from Brazil within the last year.]; 1.1 Large tree shrew (*Tupaia tana*) [1st for the zoo]; 0.0.1 Black howler monkey (*Alouatta caraya*) [CITES II]; 2.2 Polar bear (*Ursus maritimus*) [CITES II] 1.1 DNS [1st birth for one female; cubs were a bit premature and both were dead when found. 2nd birth, first successful for the other female; mother not caring for cubs, pulled for hand rearing.]; 1.1 Red kangaroo (*Megaleia rufa*) 0.1 DNS [T]; 2.2.1 Siberian tiger (*Panthera tigris altaica*) [CITES I, E/SSP] 0.1 DNS [1st litter of cubs for this pair]; 0.1 Yellow-backed duiker (*Cephalophus sylvicultor*) [CITES II] [1st birth for this female/pair. 1st duiker birth for zoo]; 2.1 Pygmy marmoset (*Callithrix pygmaea*) DNS [CITES II].

Birds - 0.0.3 Bartlett's bleeding heart dove (*Gallicolumba criniger*) [CITES II] 0.0.1 DNS; 0.0.3 Crested screamer (*Chauna torquata*).

Reptiles, Amphibians, Fish - With the opening of the Tropical Discovery exhibit in November 1993, many new species were added to the animal collection. Several of these have now reproduced and are therefore considered "firsts" for the zoo: 0.0.12 Four eyes fish (*Anableps*) 0.0.2 DNS [1st for zoo]; 0.0.6 Giant green vine snake (*Oxybelis fulgidus*) 0.0.1 DNS [1st for zoo; may be 1st captive hatching for this species; the female, however, arrived in a gravid condition]; 7.0.7 Everglades ratsnake (*Elaphe obsoleta rossalleni*) [1st for zoo]; 0.0.4 Red tailed ratsnake (*Gonyosoma oxycephala*) [1st for zoo]; 0.0.3 Phantasmal poison arrow frog (*Phylllobates tricolor*) 0.0.1 DNS [1st for zoo]; 0.0.10 Sri Lankan tree viper (*Trimeresurus trigonocephalus*) [1st for zoo]; 0.0.9 Green tree python (*Chondropython viridis*) [CITES II] [mother incubated; 1st for zoo]; 0.0.4 Mexican giant musk turtle (*Staurotypus triporcatus*) [1st for zoo]; 0.0.20 Monocellate cobra (*Naja naja kaouthia*) [1st for zoo]; and 0.0.2 Flat-tailed day gecko (*Phelsuma laticauda*) [CITES II] [1st for zoo]. submitted by Vickie Kunter, Chapter Liaison, Rocky Mt. AAZK, Denver Zoo, Denver, CO.

Miller Park Zoo (Bloomington, IL)...would like to announce the following first time hatchings for their institution from 1 July 1994 - 1 January 1995:

Birds - 1.0.1 Crested wood partridge (*Rollulus roulroul*) [0.0.1 died at 3 days old]; 1.0.1 Violet Plantain-eater (*Musophaga violacea*) [DNS at 6 days old]; and 0.0.8 Blue-black grassquit (*Volatinia jacarina*). submitted by Jan Outlaw, Zookeeper, Miller Park Zoo, Bloomington, IL.

Commonwealth Zoological Corporation (Boston, MA)...reports the following B&H for 1994:

Mammals - 1.1 Kirk's dik-dik (*Modoqua kirki*) [1st for institution]; 0.0.1 Straw colored fruit bat (*Eidon helvum*) [1st for institution]; 0.0.3 Ruwenzori long hair fruit bat (*Rousettus lanosus*) [1st for institution].

Birds - 0.0.2 Victoria crowned pigeon (*Goura victoria*); 0.0.2 Red crowned crane (*Grus japonensis*) 1 DNS [1st for institution/1st successful artificial insemination]; 0.0.2 Canvasback (*Aythya valisineria*) 1 DNS [1st for institution]; 0.1 Greater rhea (*Rhea americana*) [1st for institution/eggs were loaned from another facility]; 0.0.4 Hyacinth macaw (*Anodorhynchus hyacinthinus*) 2 DNS [hand-reared]; and 0.1 Whooper swan (*Cygnus cygnus*) [1st for institution]. submitted by Pete Costello, Senior Keeper, Franklin Park Zoo, Boston, MA.



AAZK Award Nominations Are Now Being Accepted for 1995!

The AAZK Awards Committee would like to begin accepting nominations for the **Jean M. Hromadka Excellence in Zookeeping (EZ) Award** to be presented at the 1995 AAZK Conference in Denver. The deadline for all award nominations is **1 June 1995**. All award nominations received after 1 June will be reviewed for 1996, so please keep this in mind when submitting your nominations.

All awards given by the AAZK do not have a minimum or maximum number offered each year. Also, if the nominees do not meet the qualifications and nominators do not follow the nomination procedures, they will not receive the award for which they were nominated. Please include scientific names of animals when they are included in the nomination of a special or outstanding breeding acknowledgment.

Please submit all nominations to:

Anna Michel, AAZK Awards Chair
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, OR 97221

Jean M. Hromadka AAZK Excellence in Zookeeping (EZ) Award

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Jean M. Hromadka Excellence in Zookeeping Award presented by the AAZK Awards Committee. The purpose of the award is to recognize achievement and determination of an individual in the zookeeping field and in fostering professionalism. Zookeeping is a science combining zoology, biology, animal management, behavioral observation and daily record keeping on the collection of species in their care. This is essential knowledge for maintaining a species effectively in captivity. The excellent zookeeper must excel in one or more of these areas, but not be lacking in any of them.

The character of the award includes; a plaque, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes: Volume 1; United States and Canada. The latter is published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The Excellence in Zookeeping Award was founded by John Siegel, 1974-1975 CHAIR, in 1974. The original name of the award was the Marlin Perkins Award, named after the famed zoologist who started his career as a zookeeper. The name was changed in 1978 to the EZ award. In 1990, the name was changed to the Jean M. Hromadka Excellence in Zookeeping Award in memory of her outstanding contributions to the furtherance of AAZK through committee work and as President. The award is presented at the annual AAZK National Conference.

Qualifications:

1. The nominee **must** be a full-time animal keeper, employed in any North American zoological institution, aquarium or related facility.
2. The nominee **must** have been employed at least two years on permanent status at a zoo, aquarium or related facility.
3. The nominee **must** be nominated by his or her peers who have also been employed at that same zoo, aquarium or related facility. Supporting nominations may be submitted by management personnel from the same institution.

Excellence in Zookeeping Award Criteria, Continued

Nomination Procedure:

1. List name, position, institution's name, address, phone and Director, years of service in the field and the recommendation of peers or colleagues.
2. List and document outstanding achievements: exhibits, breeding, education, etc.
3. List any extra activities outside of zoo, aquarium or related facility work: working with conservation groups, youth, wildlife officials, etc.
4. Deadline for nominations is JUNE 1st of each year.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.



Message From the President.....

Now is the time of year to be thinking of a deserving individual, chapter or institution that is deserving of one of the five National AAZK Awards. This is the first year that the Lifetime Achievement Award is offered to the membership. It is for someone who is near retirement. You will find information concerning the following awards in the listed issue of AKF. The deadline date for AAZK Award nominations is **1 June 1995**. Nominations should be sent to Anna Michel at the Metro Washington Park Zoo, 4001 S.W. Canyon Rd., Portland, OR 97221-2799.

Certificate of Excellence in Exhibit Renovation	January 1995 issue
Jean M. Hromadka Excellence in Zoo Keeping Award	February 1995 issue
Meritorious Achievement Award AND	
Lifetime Achievement Award	March 1995 issue
Certificate of Merit for Zoo Keeper Education	April 1995 issue

The Board of Directors presents two awards: The Certificate of Appreciation is given to an individual outside of the American Association of Zoo Keepers, Inc. for deeds on behalf of AAZK and its members. The Certificate of Recognition is given to an outstanding AAZK member for their works on behalf of AAZK. Send nominations for either of these two awards to Board member Marilyn Cole, Metro Toronto Zoo, P.O. Box 280, West Hill, Toronto, Ont., Canada M1E 4R5. The letter of nomination must specifically mention the deed worthy of such appreciation.

AAZK also offers two \$750.00 research grants per year. Please send inquiries to Susan Barnard, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315-1440. Deadline for research grant applications is **1 March 1995**. The Conservation, Restoration and Preservation Committee is now offering conservation grants. Bret Sellers, Metro Washington Park Zoo, has an article on this grant in the January 1995 AKF. Deadline for applications for conservation grants is **31 March 1995**.

I hope you will consider taking advantage of these awards and grants. They are part of the services offered to the membership. On another note, I want to remind Chapters that their recharter packets are due at Administrative Offices by **15 February 1995**.

Janet McCoy, President AAZK, Inc.
Metro Washington Park Zoo, Portland, OR



The Exhibit Design Resource Notebook (EDRN)

*submitted by Mike Demlong, EDRN Coordinator,
The Phoenix Zoo, Phoenix, AZ*

The purpose of the EDRN is to document existing animal exhibits at zoos, aquaria, and conservation centers in North America and other continents. To accomplish this end the committee has produced a comprehensive survey form designed to compile pertinent exhibit information on all species of animals: invertebrates, fish, mammals, birds, reptiles, and amphibians. With sufficient completed survey forms in hand, we hope to produce a reference for facilitating the creation of, or improvement of zoo animal exhibits. Ideally the notebook will provide useful exhibit design and maintenance information about specific species, to compliment but not substitute for, a comprehensive research format.

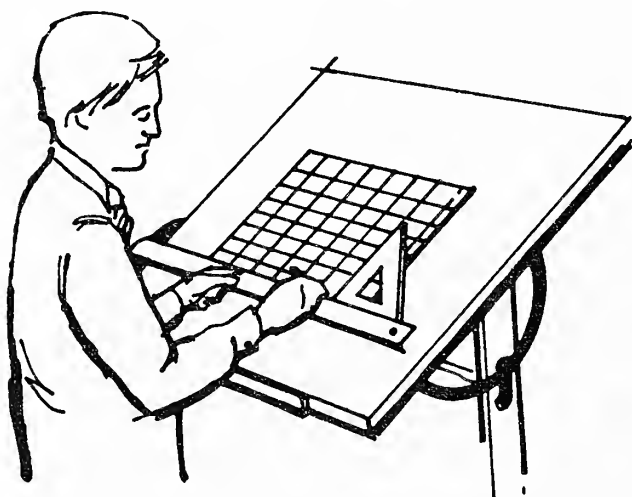
Unfortunately, despite numerous appeals in the *Animal Keepers' Forum*, the AZA *Communiqué*, and direct mailings to every zoo and aquarium director in North America, participation has been dismal. Without the support from dedicated professionals the project is doomed to fail.

The form is relatively painless to complete, taking only 15-30 minutes of time. We are not asking for you to document every exhibit on grounds, just those you think work well or are of exceptional quality. If you call or write, I'll send you as many forms as you and your colleagues need - free of charge. However, please complete and return all you ask for, as they are expensive to print and mail. To save postage I have listed below - as a "gentle reminder" - those persons who have requested EDRN forms but have yet to return them.

Janet Latham, Oklahoma City, OK
Michelle Acuna, Tucson, AZ
Tim Hill, Apple Valley, MN
Craig Berg, Milwaukee, WI
Mary Wykstra-Ross, Salt Lake City, UT
Tim Sampson, Grand Rapids, MI
Chuck Smith, Corpus Christi, TX
Bob Brown, Salina, KS

Isabelle Bellavance, Quebec, Canada
Charla Dawson, Pueblo, CO
Ric Urban, Houston, TX
Patricia Carney, Keaay, HI
Peggy Ferebee, Greensboro, NC
Kelly Hantz, San Antonio, TX
LeeAnn Anderson, Honolulu, HI
Diana Frisch, Powell, OH

Thank you in anticipation of your support. For EDRN forms or additional information concerning the project, contact me at:



The Phoenix Zoo
c/o Mike Demlong, Design Department
455 North Galvin Parkway
Phoenix, AZ 85008-3431
office number - (602) 273-1341 Ext. 7326
FAX (602) 273-7078
home (602) 841-6713



STAMPEDE into COLORADO

Friday, 22 September, 1995 for the Pre-conference trip to Colorado Springs and the Cheyenne Mountain Zoo, and the Post-conference trip (Friday, 29 Sept. - 1 Oct.) to Estes Park and Rocky Mountain National Park. Plan your vacation NOW !



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FIRST CALL FOR PAPERS

Plan now to share your knowledge with your fellow keepers. Proposed paper, poster and workshop topics will be accepted on all aspects of zoo keeping.

- * Papers will be limited to 15 minutes followed by five minutes of questions.
- * Workshop sessions will be provided for programs, discussions and debates.

PLEASE SUBMIT A SHORT ABSTRACT FOR ALL PROPOSED PAPER, WORKSHOP AND POSTER PRESENTATIONS BY 1 JUNE 1995. ABSTRACTS SHOULD INCLUDE THE NAME OF PRESENTER, PRESENTER'S JOB TITLE, ZOO AFFILIATION, TITLE OF PAPER, PROPOSED FORMAT (PAPER, WORKSHOP, POSTER, ETC.) AND EQUIPMENT NEEDED FOR PRESENTATION (SLIDE PROJECTOR, VCR, OVERHEAD PROJECTOR, ETC.).

Send abstracts and any program suggestions to:
Todd Cleveland, 1995 AAZK Conference
Denver Zoo
City Park
Denver, CO 80205-4899.

Image-Making in the Elephant World

By Dinah Wilson
Elephant Manager Association Lisison at AAZK, Inc.
Marine World Africa USA, Vallejo, CA

The elephant training profession is currently viewed in a controversial, and often negative, way. Due to an onslaught of sensational media coverage, we find ourselves on the defensive.

There are a number of things we can do to help turn this mistaken perception around. Most importantly, we need to reach out to the general public in the most professional way possible at every opportunity.

One of the most effective ways to do this is through the promotion of hands-on interaction between park guests, the elephants, and knowledgeable trainers. These interactions include close-up elephant introductions which allow guests to touch, play tug-of-war, and ride elephants. Other activities involve trainers walking elephants through the park and an elephant banquet which allows guests to get a close look at what and how an elephant eats. These events are part of a structured program designed to be safe and enjoyable for both elephants and humans.

Even if your facility or circumstances cannot allow these types of encounters, there are other opportunities for you to positively influence the public's perception of our profession. Of primary importance is maintaining a professional appearance. Although it is difficult to remain clean around elephants, being well-groomed and wearing a proper uniform will make a favorable impression on the public.

Of utmost importance is staying current on elephant issues and becoming as knowledgeable as possible about the animals in your care. This is especially necessary because the general public has become increasingly conservation-oriented and desires accurate and up-to-date information on the status of these endangered animals.

If your facility has a Public Relations Department, maintaining a good rapport with them is essential. Keeping the Public Relations' staff informed about your elephants and their care will enable them to have a better understanding of your job should a media crisis occur.

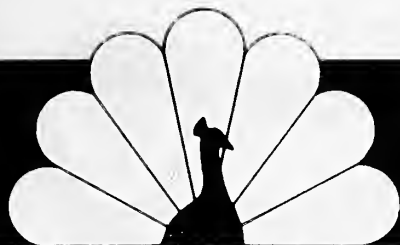
Whenever possible, promote the many worthwhile and enjoyable aspects of your elephant program. Be creative and enthusiastic. Elephants worked in protected or free contact can be made available in numerous ways for special events.

At Marine World/Africa USA we stress with the media, as well as the general public, the excellent care given our elephants. We are fortunate to be able to spend the entire day with the elephants. This allows the public to witness all phases of the training and exercise our elephants experience. We discuss with the guests what we are doing, why we are doing it, and invite them to ask questions. This attitude of openness is valuable because it adds to our credibility and permits dialogue between staff and guests. If a guest views an elephant procedure in a negative light, it is often because he or she does not fully understand the circumstances. The Marine World staff will make every effort to talk to such an individual rather than allow an uninformed and unhappy person to leave with a bad impression.

The elephants' daily care must come first and is of primary importance. However, while the extra attention given to the general public does require additional time, energy, and patience, it cannot be overlooked. If necessary, encourage management to assist you in finding the extra time and tools needed to positively interact with the public.

Maintaining a professional attitude and positive image can reap great rewards for your facility, the elephant managing profession, and, most importantly, for the elephants in your care. It is certainly worth any 'extra effort' that might be required.





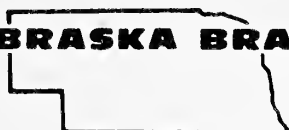
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Zoo Infant Development Two-Volume Reference Set

Edited by Harmony Frazier, LVT, Woodland Park Zoo, Seattle, WA and
Kathleen Hunt, B.A., Dept. of Zoology, University of Washington



The American Association of Zoo Keepers, Inc. is pleased to announce the availability of an important reference work. This 1820-page, two volume set is a reference manual of the physical and behavioral development of parent-reared mammal infants in captive collections. These volumes include normal rearing information and weights for many species and can be quickly utilized for quick comparison and reference when deciding whether an infant is being properly cared for or is in need of intervention.

The volumes are divided into four sections: 1) Infant Development Data Sheets (a total of 419 individual records); 2) Weight Data (including many charts and graphs); 3) Bibliography (144 pages of bibliographic references) and 4) Index (species included are indexed by both common and scientific names). The Infant Development Data Sheets and the Weight Section are subdivided by color coded taxonomic order tabs. The Zoo Infant Development Notebook is packaged in two sturdy 2-inch expanded D-ring binders and include a full-size page lifter for ease of use.

To order, fill out the form below and return with your payment to: AAZK, Inc. ZIDP Notebook, 635 S.W. Gage Blvd., Topeka, KS 66606-2066 U.S.A. Checks or money orders should be made payable to "AAZK, Inc." (U.S. FUNDS ONLY). If using a credit card, make sure to complete all requested information on form. Prices are:

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Prices include Domestic Book Rate Postage. Overseas orders must add \$40.00 for parcel post surface shipping. Canadian orders will be mailed within Canada. Please allow 4 - 6 weeks for delivery.



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Construction of Small Fiberglass Exhibits for Reptiles, Amphibians, Fish & Invertebrates

By
Chuck Smith, Student
4942 Platt Springs Road, Box 7, West Columbia, SC 29169

Introduction

As zoos continue to move toward providing naturalistic enclosures for their charges, the task of upgrading and improving exhibits in the small zoo sometimes falls upon the shoulders of maintenance staff, grounds departments, and the keepers themselves. Small zoos often have the added liability of limited budgets in developing new exhibit areas. As a consequence, staff members find themselves with a need to construct aesthetically pleasing, natural exhibits while doing so with relatively inexpensive and easily obtained materials, all within the confines of the average metal and wood working shop.

The following describes one exhibit alternative in the form of a small, lightweight enclosure, suitable for amphibians, reptiles, fish, invertebrates and numerous other specimens that might otherwise be housed in a 15-20 gallon aquarium. These enclosures are not only lightweight, but also extremely durable, easily disinfected and serviced, and adaptable to both aquatic and terrestrial specimens. They are built using relatively inexpensive materials, requiring only a basic knowledge of power tools and fiberglass techniques and are modular in design, so exhibits can be changed quickly as specimens change.

Figure 1 shows one example of a completed enclosure designed for ranid frogs. This exhibit has been fitted with a canister filter and planted heavily along the back. The aluminum track at the bottom front and mounting bracket at the top should be noted. These allow the exhibit to be lifted upwards for removal, and another exhibit simply slid in its place.

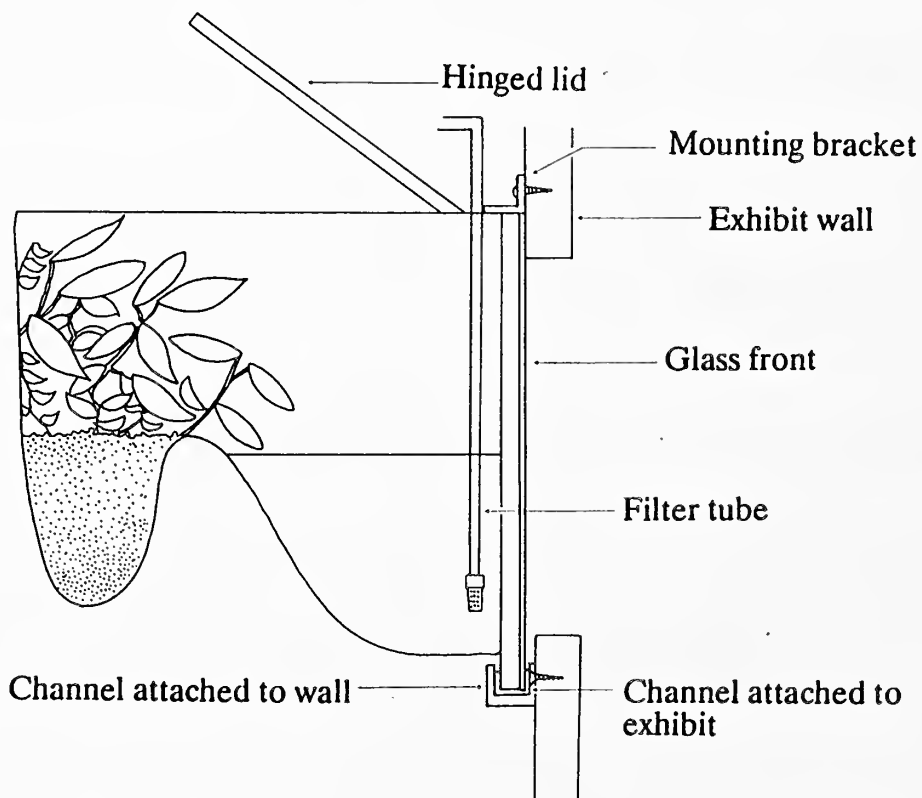


Fig. 1. Completed exhibit mounted behind exhibit wall.

Construction of Small Fiberglass Exhibits, Continued

Construction

Once the size of the enclosure has been decided upon, a wooden box comprised of a back, bottom and two side panels, is constructed from 5/8" to 3/4" plywood. This is the "frame" that supports the chicken wire upon which fiberglass cloth will be applied. Two important side notes are necessary before proceeding. First, the cage should be at least two inches wider than the opening in the wall behind which the cage will be installed. This provides a small space in both front corners to run filter plumbing without it being visible. Secondly, because the tank is supported solely by the aluminum track and mounting bracket, it should not be overly large nor excessively deep. A good rule of thumb is to keep the size within a 24" width and 18-20" depth limit.

Once the box is complete, three 1/2" x 1" strips of wood are temporarily attached around the three edges of the front (Figure 2). This lip will eventually be used to secure the glass front as well as provide a flange that slides into the aluminum channel mounted on the wall.

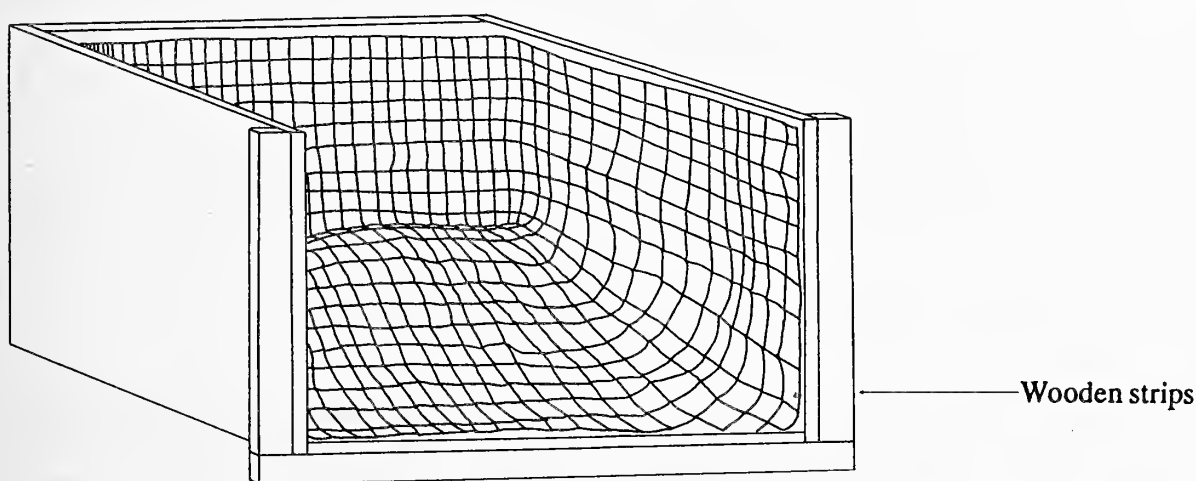


Fig. 2. Wooden box with chicken wire installed and wooden strips attached.

Installing the wire form is the next step. Here is where the imagination of the builder especially comes into play. Chicken wire is stapled into the box, rounding off the corners and creating planting pockets, pools, hiding retreats, cave-like crevices or any configuration that looks appropriate to the specimens to be housed. Refer to Figure 1 for an idea of an aquatic enclosure containing a deep pool in the front, a simulated sloping mud bank, and a large planting pocket in the rear.

After the chicken wire has been installed, two layers of resin-soaked fiberglass cloth are laid over the wire and allowed to set overnight. The cloth should extend 1/2" above the top edge of the wooden box and wrap around the 1/2" x 1" wooden strips in the front. Note that the cloth is easier to work with if it is cut into 8" x 8" squares prior to soaking with resin.

Once the fiberglass has set, the final interior coat is applied. Depending on the habitat to be portrayed, various materials are added to the resin for texture. For example, if the desired effect is that of a mud bank, peat moss can be mixed in with the resin, then applied using a three-inch paint brush. Sand, crushed leaves, even gravel can be added. It is particularly important, however, that the final texture NOT be applied to the wooden strips, for the glass front will be sealed against them. Small branches, roots or other appropriate props may also be fiberglassed into place, although these make the enclosure more difficult to disinfect and they eventually will have to be replaced.

When the final coat has hardened, the excess fiberglass extending above the top edge of the box is trimmed off using a small handsaw. The fiberglass shell is then removed from the box, including the 1/2" x 1" wooden strips which remain attached to the shell. Removal will

Construction of Small Fiberglass Exhibits, Continued

no doubt destroy the chicken wire, however this will be discarded anyway. After removal, as much of the wire as possible is cut away from the shell and two layers of resin soaked fiberglass cloth are applied to the outside, including the wooden strips.

To fabricate the top, the cage is placed upside down on a 3/4" thick piece of plywood and the inside traced onto the plywood and cut out using a band saw (Figure 3). A hinged lid is then cut out of the plywood using a jig saw and a second opening cut from this, providing a place to staple 1/8" wire mesh for lighting and ventilation.

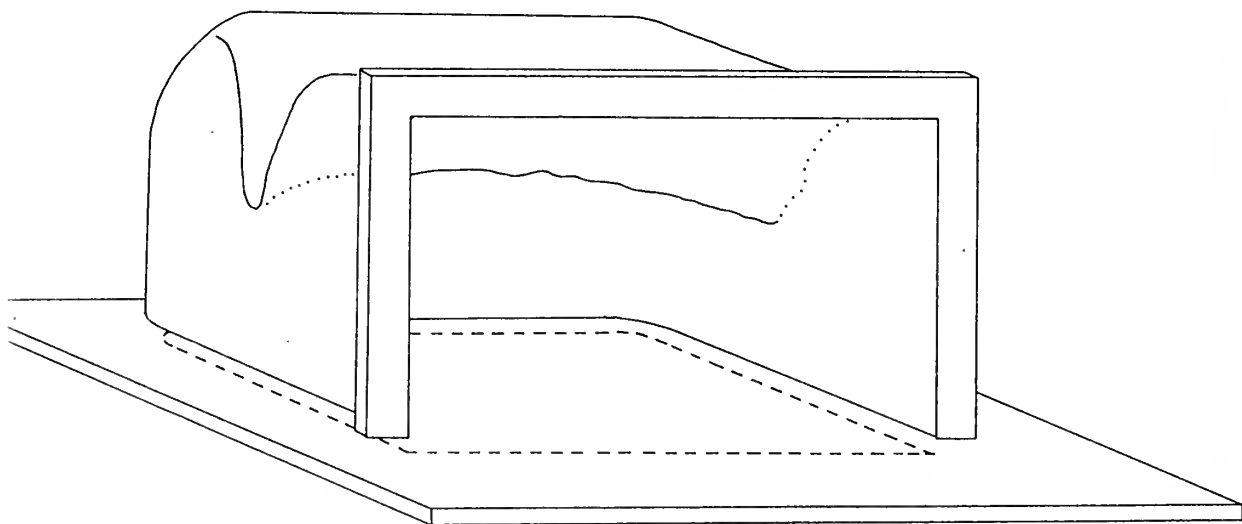


Fig. 3. Measuring for exhibit top. Plywood should be cut along dotted line.

All the plywood pieces are painted with three coats of a polyurethane based paint, allowed to dry, and installed using small screws (Figure 4). The glass front is held in place with clear 100% silicon sealant liberally applied to the wooden strips and front edge of the top. A 3/4" x 3/4" aluminum channel is then siliconed over the bottom strip to protect the glass from chipping. For added strength, two to four small wood screws may be used to attach the aluminum channel.

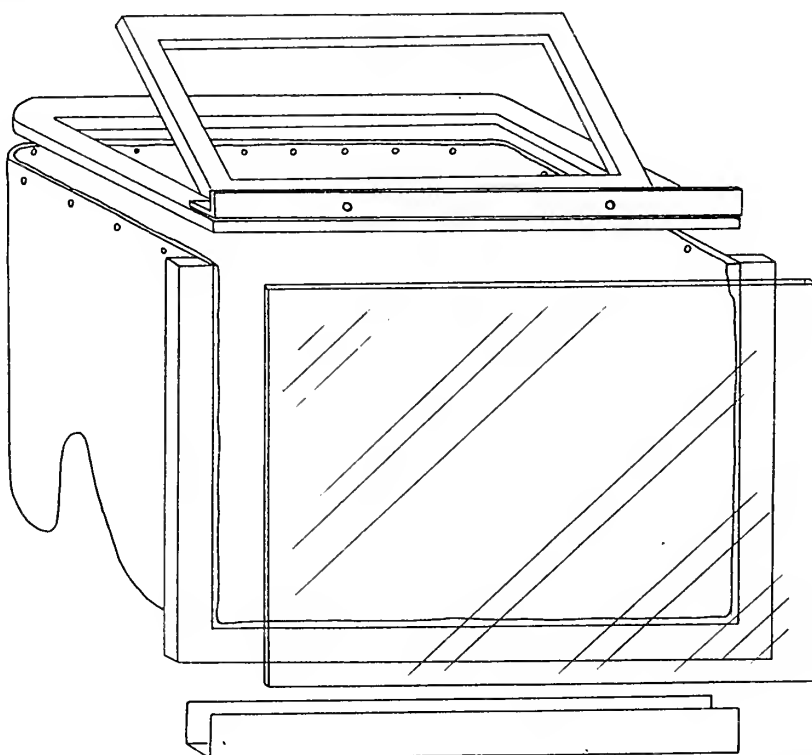


Fig. 4. Exhibit components prior to assembly. Opening in hinged top should be covered by wire mesh. Glass is installed using silicon sealant and aluminum channel attached over glass bottom and wooden strip.

Construction of Small Fiberglass Exhibits, Continued

The mounting bracket along the top is fabricated from 1" x 1" aluminum angle. This is attached to the top, flush with the front of the exhibit, using wood screws every two inches. Two holes are drilled in the face of the aluminum angle for the screws that will hold the cage to the wall.

The enclosure is now complete and ready to install. Aluminum channel of sufficient size to allow the flange to slide in and out of it is mounted along the bottom of the wall opening. The mounting screws should be countersunk to avoid interfering with the flange (Figure 5). The cage is then simply slipped into the lower aluminum channel and screwed into the wall through the mounting bracket along the top.

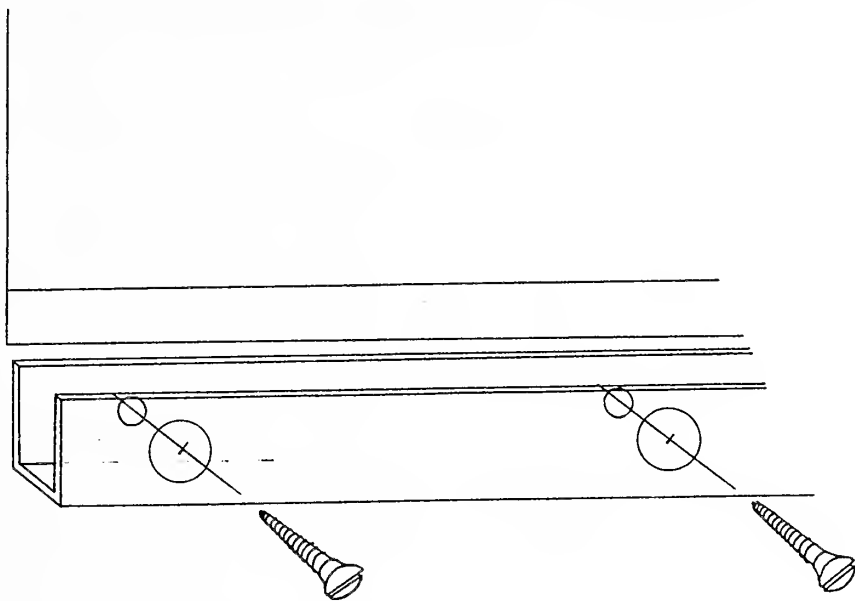


Fig. 5. Installing aluminum channel to exhibit wall. Screws should be countersunk.

Once installed, the addition of a filtration system can be accomplished in two ways. Holes may be drilled in each of the front corners of the top and rigid plastic tubing run down the sides into the water, or holes may be drilled into the enclosure itself and the plumbing sealed using silicon.

If a planting pocket has been included, it needs some form of drainage. The simplest method is to use aquarium tubing. To do this, a small amount of water should be placed into the planting pocket to determine where the low point is. At this point a small hole is drilled and aquarium tubing threaded through and sealed with silicon. The other end may be run into a floor drain or catch basin.

To disinfect the enclosure, it is drained (if it is used for aquatics), slid up and out of the track and the plants and soil removed. It may then be completely submerged in a disinfecting solution or scrubbed and rinsed with hot water and allowed to air dry.

Final Thoughts

As a large portion of the materials used in these exhibits may be reused (the wooden box) or obtained as scrap (the chicken wire and wooden strips from a building supply company and the aluminum angle and channel from a scrap or recycling yard), the cost per unit is quite reasonable. The major expense is the fiberglass resin and cloth. However, when purchased in bulk quantities, such as five gallon buckets of resin, numerous exhibits may be fabricated for a relatively low price.

(Note: If you wish more information or have questions, you may contact the author by phone/FAX at (803) 356-1443.)



Staff Exchange - 1995

*By Dale Frerking
AAZK Staff Exchange Coordinator
Kansas City Zoo, Kansas City, MO*

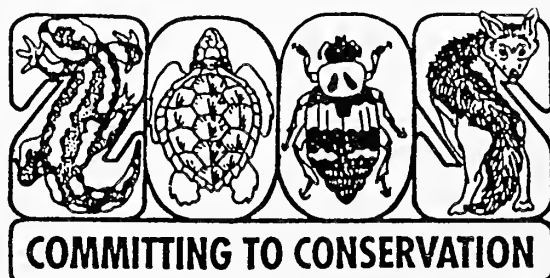
Early every year the Staff Exchange Project publishes information relevant to the goal of establishing a world-wide network of wildlife institutions that exchange staff regularly as a standard, on-the-job training tool. In this space we normally give standard background information and data on resource availability, including updates on the Exchange Access List, plus insights into the general direction in which the Project is heading.

Briefly, for the benefit of new readers and as a refresher for others, the Staff Exchange Project is a Membership Service of AAZK, Inc. (although one need not be an AAZK member to take advantage of our information). We provide, free of charge, materials and information helpful to persons interested in pursuing a reciprocal exchange with an employee in another zoological institution, or alternately, a working visit to another facility. The project has progressed steadily over the course of the last 12 years to promote exchanging and now has a current listing of 70 institutions that have sent information indicating various levels of interest and availability for exchanges.

In this issue of *AKF* we will dispense with further insights into the whys and hows of exchanging in order to give readers an example of a successful program via the Enrichment Options column which follows this article. The Arizona-Sonora Desert Museum had participated in exchanges previously, one of which was focused on animal enrichment. One facet of our Staff Exchange Project is to "train" the membership to send this Project a brief synopsis if a successful exchange occurs. The letter you will read in the following Enrichment Options column arrived unsolicited from a participant in that exchange program.

While every institution is different in their policies regarding exchanging, opportunities are available for those who will find them. Rewards of knowledge and professional interaction are in store for those institutions and individuals who take or create the opportunities. Feel free to write for further information to:

Dale Frerking
AAZK Staff Exchange
Kansas City Zoo
6700 Zoo Drive
Kansas City, MO 64132-4200



THE COLUMBUS ZOO • JULY 13 - 16, 1995

For further information about the Committing to Conservation Workshop, contact either Beth Armstrong/ Apr House or Beth Pohl/Children's Zoo at The Columbus Zoo, Box 400, 9990 Riverside Drive, Powell, OH 43065-0400. Phone (614) 645-3426 or (614) 645-3442.



Enrichment Staff Exchange

In July I went to the Columbus Zoo on a staff exchange. There were many reasons that I chose CZ, but the most important was to work with Dianna Frisch, head Bonobo keeper and Chair of the National AAZK Enrichment Committee. Dianna is also the Enrichment Coordinator at Columbus, and I wanted to learn more about this increasingly popular occupation. Also, coming from the Arizona-Sonora Desert Museum, where only Sonoran Desert natives are exhibited, I wanted to see what it was like working in a large zoo with exotic animals. It was a great experience. I was able to work beside keepers and head keepers in each of the animal departments and learn about their animals, their ways of doing things, their concerns, problems and joys. Each department set aside some time to talk with me about the enrichment they do. It was a great way to learn a lot, get refreshed about my career and meet some wonderful people!

Staff exchanges are really a win-win situation. They are great for both institutions involved (even if only half of the exchange is completed). It provides a great opportunity for learning new or different ways of doing things, different products or ways of exhibit design, and increases networking. We encourage you to try an exchange with the idea of learning more about enrichment. Normally, to bring new ideas and insight to your own institution, you would need to hire someone new or bring in a consultant. While these things do happen, an exchange is a great way to invest in and develop existing staff.

The Arizona-Sonora Desert Museum sets aside some money for staff to participate in exchanges. For approved exchanges, ASDM will pay air fare up to a maximum of \$500.00. Salary is paid as normal, but no overtime or compensatory time is covered. Benefit coverage continues as well. A *per diem* meal allowance of \$30.00 per day is paid.

While this is extremely generous, if your institution does not have an existing exchange policy, it is possible to accomplish one cost effectively. Housing could be provided by interested keepers at the host institution. You could drive to reduce transportation costs. You could tack the exchange on to a vacation you were already planning. Scheduling could be done "off season" so that staffs won't be left too short-handed. (Keepers should be allowed to go on vacation or call in sick, so if an institution can survive that, why not an exchange?) It will not only enhance your professional experience and credentials, but also may open your eyes to the things about your own institution that you really like and take for granted.

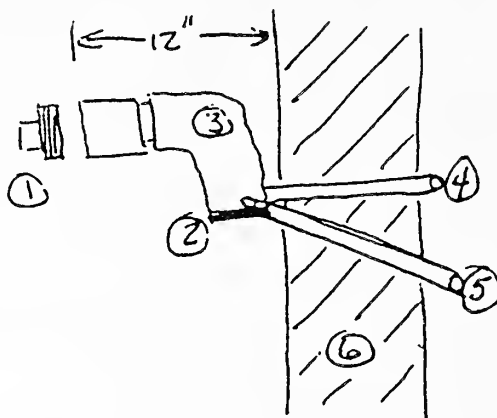
If you have questions about ASDM's policy you may call or write to: Michelle Acuna at 2021 N. Kinney Road, Tucson, AZ 85743; (602) 883-1380, Ext. 187. For further information about the AAZK Staff Exchange Program contact: Dale Frerking, Kansas City Zoo, 6700 Zoo Drive, Kansas City, MO 64132-2400.

--submitted by Michelle Acuna, Keeper
Arizona-Sonora Desert Museum, Tucson, AZ

Enrichment Options, Continued

MEERKAT - Live insect feeder sporadically distributes live insects onto exhibit from several different openings. Live insects are placed in holding chamber. They randomly work their way down the distribution tubes (depending on length of tube) to fall onto exhibit, ideally stimulating animal activity and normal feeding behaviors.

1. Screw out cap
2. Plastic knockout plus for bottom
3. 4" ABS threaded coupling solvent welded to a 4" 90° ABS elbow
4. Horizontal or slightly pitched PVC (1/2") pipe for distribution of crickets
5. Angled ($\pm 60^\circ$) distribution pipe for mealworms
6. Exhibit wall or artificial tree or rock



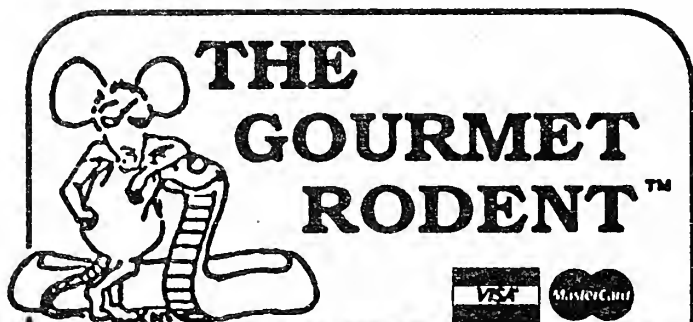
Estimated cost: \$15 for materials

Positive Aspects: Construction and installation less than one hour; easy to clean and service; weatherproof, and invisible to zoo guests.

--Mike Demlong, Design Dept.
The Phoenix Zoo, Phoenix, AZ

ENRICHMENT LOGS AND BRANCHES - logs and branches for lemurs, chimpanzees, tamarins and other animals. Holes are drilled into branches or logs and stuffed with treats. Size of holes depends on species and treats given. Branches or logs are hid in exhibit among other props for animals to search for. (Don't fill all the holes with treats.)

--Melanie Haynes, Keeper
Pueblo Zoological Society, Pueblo, CO



RATS AND MICE

Bill & Marcia Brant

6115 SW 137th Avenue

Archer, FL 32618

(904) 495-9024

FAX (904) 495-9781

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Need to Reach AAZK?

1-800-242-4519 (U.S.)

1-800-468-1966 (Canada)

FAX: (913) 273-1980

or write

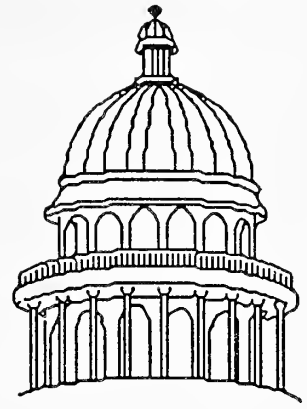
AAZK, Inc.

635 S.W. Gage Blvd.

Topeka, KS 66606-2066

Legislative Outlook

*Compiled by
Phyllis Nilson-Wojcik
Legislative Advisor*



TNC Signs Agreement With Georgia-Pacific to Protect Timberlands

The Nature Conservancy (TNC), the largest private owner of nature preserves in the U.S., and Georgia-Pacific Corp. (GP), one of the world's largest forest products companies, have announced an unprecedented agreement to jointly protect and manage more than 21,000 acres of Georgia-Pacific-owned lands along North Carolina's Lower Roanoke River.

Through the agreement on the Lower Roanoke, GP and TNC will develop a joint ecosystem management plan governing any activity on the land, including timber harvesting. In addition, GP has agreed to total protection of the Jamesville Island and Swan's Bay tracts, which comprise nearly 6,500 acres designated as "high priority" for preservation by TNC. All rights to timber harvesting on these lands are permanently relinquished through the agreement.

The land is part of the most important brownwater river ecosystem in the Eastern U.S. and is designated as one of the Conservancy's "Last Great Places" - a compilation of precious natural areas cited by TNC scientists as most in need of protection. Seven large tracts, comprising almost all of the swamps and bottomland still unprotected along the Lower Roanoke River, will be governed by the joint agreement. The tracts comprise one of the two largest remaining Southern forested wetlands on the Atlantic coast.

The lands governed by the agreement include areas of North Carolina that encompass some of the most important breeding grounds for neo-tropical birds along the Mid-Atlantic Coast. The lands support more than 200 bird species and include a significant nesting site for the American Bald Eagle and seven heronies. In addition, the region supports a wide variety of wildlife, including some of North Carolina's largest populations of Whitetail Deer and Wild Turkey. It is also considered a critical spawning area for striped bass. Through the management plan, the entire area will be designated as a Black Bear sanctuary.

Secretary of the Interior Bruce Babbitt praised the agreement saying that its importance is that "...it proves that a forest products company and conservation interest can develop hands-on resource management partnerships."

>Press Release from The Nature Conservancy, December 1994

Public Comment Sought on Draft Endangered Species Guidelines

The Interior Department's U.S. Fish and Wildlife service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS) are seeking public comment on a series of draft guidelines designed to ensure consistency in administration of the Endangered Species Act. The draft documents provide guidance to agency staff on developing habitat conservation plans, managing petitions, conserving species that are "candidates" for listing, consulting with other Federal agencies, and defining "populations" of vertebrate species eligible for listing under the Act.

Newly proposed guidelines on petition management more rigorously define those species and actions that may be petitioned under the ESA. The Act allows any individual to petition the USFWS or the NMFS to list, delist, or reclassify a species. The draft document also provides guidance on timeframes for responding to petitions and notification of petitioners. Draft guidelines were also proposed on conserving species that are candidates for listing. The guidelines provide information on how to identify species as candidates and provide direction for monitoring candidates to ensure they do not become extinct while awaiting a decision on whether to go forward with listing.

For detailed information on the draft guidance documents or to submit written comments, write Chief-Endangered Species, USFWS, ARLSQ-452, 1849 C Street NW, Washington, DC 20240; or Chief-Endangered Species Division, NOAA/NMFS, OPR 13342, 1335 East-West Highway, Silver Springs, MD 20910.



A New Species of Chimpanzee?

A third species of chimpanzee may have been identified in western Africa. A team of researchers, including Dr. Philip Morin, a population geneticist from the University of California, and chimpanzee expert Jane Goodall, has discovered that the genetic makeup of the Versus chimpanzee, previously thought to be a subspecies, is distinctly different from that of the two known species, the Pygmy chimpanzee of Zaire and the Common chimpanzee of central Africa.

The scientists were able for the first time to collect and analyze DNA samples taken from hair cells of 37 chimpanzees in 20 locations throughout central and western Africa, in an attempt to match the behavioral characteristics of each species to its genetic make-up. The previous assumption that only two species existed was based primarily on observations of chimpanzee behavior.

Unexpectedly, the team found three distinct genetic patterns. The third group, Versus, was previously thought to be subspecies of the Common chimpanzee. Morin said the Versus chimpanzee is the most endangered of the types because its numbers in the wild are significantly fewer. Until recently, many were harvested for research or international trade. Moreover, they have been pressured by human population growth in western Africa and degradation of their habitat. Morin's team studied Versus chimpanzees in Sierra Leone, Ivory Coast and Mali.

The study also shed light on why male chimps tend to cooperate better than females, the opposite behavior usually observed in other primates. The researchers discovered that most males in these colonies are closely related, often as half-brothers, while the females are not as closely related.

Morin stressed that more research is needed to compare behaviors and genes among the three types of chimpanzees. "Until we have more evidence to consider, we can't fully evaluate what we've discovered," he said. "For one thing, we still don't know enough about chimp evolution, because we don't have fossils, and we don't know enough about their behavioral differences.

In the meantime, Morin recommended treating the Versus chimp as a species instead of subspecies for purposes of conservation and research. A footnote to the study: the Versus chimp uses tools instead of its hands to open nuts. That's a difference, says Morin, that took only 1.5 million years to develop.

>from *Wildlife Watch* in *Wildlife News*, published by The African Wildlife Foundation, 1717 Massachusetts Ave. N.W., Washington, DC 20036. ©1995 African Wildlife Foundation



Maned Wolves

(*Chrysocyon brachyurus*)

at the Houston Zoo

By
Joan M. Steinhaus, Zookeeper
Houston Zoological Gardens
Houston, TX

Introduction

A pair of Maned wolves (*Chrysocyon brachyurus*) arrived at the Houston Zoo on 26 May, 1992. The pair had been together in Rushden, England at the Ravensden Zoo from 8 June, 1990, until their transfer to Houston. The male "Saco" was born 2 April, 1989 in Amsterdam and the female "Lita" was born 1 February, 1989, in Praha (Figures 1 and 2). Lita was left with her sibling (studbook #1025) in Rushden and they produced a litter of three pups on 7 January, 1992. All pups were cannibalized within the first 24 hours after birth. Maned wolves are listed USFWS Endangered, and CITES Appendix II. The transfer of this pair to Houston brought with it bloodlines not well represented in the North American population.

After completing a 43-day quarantine period, the wolves were moved to their exhibit on 8 July, 1992. They were kept in their night quarters for one week to allow for adjustment to their new environment. After numerous changes, their diet consists of:

- one adult rat (per wolf) in a.m., primarily as a reward for shifting.
- free choice Purina Pro Plan® dry, three cups per wolf
- shredded produce (in kilograms): carrots .22, cucumber .115, squash .115, yams .115, banana (whole) .22, cantelope .115, grapes (whole) .115, pear .115, and apples .115. Total fruit and vegetable mix was 1.245 kgs.

Exhibit

The Maned wolf exhibit includes night quarters with six separate holding cages. These cages are inside a U-shaped building that also has night quarters for a pair of Jaguars (*Panthera onca*). The cages have concrete floors and side walls, with welded wire fencing completing the front and top of the enclosure. Two cages have hay substrate to offer the wolves a resting area. One cage is set aside for food and two cages are left as is. There is a den cage that contains a whelping box to which the wolves did not have access (Figure 3).

The outside exhibit is somewhat oval in shape. There are 25 lexan panels which allow for public viewing, running approximately 75% of the exhibit's perimeter. The side of the exhibit directly opposite the lexan is a tight woven black plastic covered by a bamboo fence and foliage. The far back section of the exhibit is gunite which contains the shift door into the night quarters for the wolves and the keeper access door. A large pool, four mature trees, a hay bed and numerous small shrubs make up the final contents of the exhibit. The top of the enclosure is 4" x 4" welded wire fencing that is approximately half covered by Cherokee Rose bushes. The exhibit has pine bark and decomposed granite substrate, but the majority of the yard is covered with grass (Figure 4).

Operant Conditioning

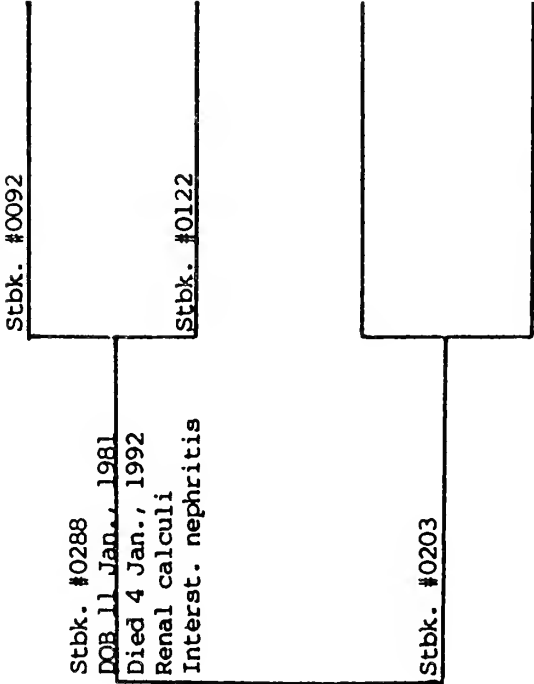
After the wolves had adjusted to their new holding quarters, they were given access to the outside exhibit on 15 July, 1992. Lita ventured out first and explored most of the area. Saco also came out after approximately ten minutes and was very active and interested in his surroundings. The pair was left with access to the yard that evening. The next morning operant conditioning began. The wolves were conditioned with a bell and rewarded or given a food reinforcement when they passed through any shift door. This positive reinforcement continued from 15 July through 29 July. On 30 July, 1992, keepers changed to a whistle signal and clicker reinforcement. All was going well, the wolves were shifting in each morning to receive their favorite food item (a rat). The conditioning of the wolves to shift into their night quarters allowed the keepers the opportunity to complete daily maintenance on the exhibit and allowed for a closer check on the wolves.

HOUSTON ZOOLOGICAL GARDENS
PEDIGREE SHEET

Please try to give as much lineage information as possible; ie, ISIS #s, birthdates, import data, names, etc.

Maned Wolf, *Chrysocyon brachyurus*
Male, HZG #13676
"Saco"

SIRE'S LINEAGE



PARENTS

Stbk. #0599
Amsterdam #M87081
DOB 27 Dec., 1986
Rotterdam
Stbk. Name AR-1

GRANDPARENTS

Stbk. #0166
0166 and 0168
are siblings

GREAT-GRANDPARENTS

Stbk. #0383
Amsterdam #M87082
DOB 21 Feb., 1983
Berlin
Stbk. Name AR-2
"Helga"
F=.250

DAM'S LINEAGE

Stbk. #0168

HZG #13676
Stbk. #971

DOB 2 April, 1989
Amsterdam
Stbk Name AR-4
Arrived HZG
26 May, 1992

0166 & 0168
have offspring at:
Belfast
Berlin
Amsterdam
Gdansk

Figure 1. Pedigree chart
for 1.0 Maned Wolf,
"Saco"

HOUSTON ZOOLOGICAL GARDENS
PEDIGREE SHEET

Please try to give as much lineage information as possible; ie, ISIS #s, birthdates, import data, names, etc.

Maned Wolf, *Chrysocyon brachyurus*
Female, HZG #13677
"Lita"

SIRE'S LINEAGE

Stbk. #299
DOB 3 Feb., 1981
Krefeld
Arrive 28 Jul., 1982
Praha, #890007
Stbk. #0072
Stbk. #0107

Stbk. #439

Sold Olomouc
3 Sept., 1992

Stbk. #220

Stbk. #298

DOB 11 Nov., 1981
Krefeld
Arrive Praha
28 Jul., 1982
#890098
Stbk. #163

PARENTS

HZG #13677
Stbk. #1029

DOB 1 Feb., 1989
Praha
Arrive HZG
26 May, 1992
F=.125

#220 & #163
have offspring at:
Dickerson
Detroit
Berlin
Krefeld
Dengbruk

#297 and #298
are siblings.

GRANDPARENTS

Stbk. #220

GREAT-GRANDPARENTS

Stbk. #163

DAM'S LINEAGE

Figure 2. Pedigree chart
for 0.1 Maned Wolf,
"Lita"

Maned Wolves at the Houston Zoo, Continued

First Breeding Season

We were very hopeful for the first breeding season. The wolves had settled in well and seemed quite compatible. No breeding was observed by the staff, although we did receive a report from a zoo docent on 7 October, 1992, that she observed the male attempting to mount the female. The only other breeding behaviors observed were on 9 October, 1992, a keeper reported Lita was flagging her tail and Saco was licking her anal-genital region. There was a drop in diet consumption, but no conclusion was reached as to the cause. We calculated the gestation period and prepared the den area. Lita showed no change in behavior or weight. We monitored her closely, but no pups were born.

Second Breeding Season

There were no significant behavioral changes to the animals' interaction for the next ten months. Both wolves were sedated in October of 1993 for physicals. 1.0 Saco weighed 28.1 kgs, 0.1 Lita weighed 24.3 kgs. The wolves received general physicals and were vaccinated. Their teeth were cleaned and radiographs taken. Both were in excellent health.

After being separated for two nights due to the sedations, the behavior exhibited between the two animals was very interesting. The wolves were very excited, simultaneously trying to sniff and lick each other's anal-genital area, flipping their tails out and up. Their hair was erect and they were stamping their forelegs. The main goal of both wolves appeared to be establishing the dominant position. They both would open their mouths and occasionally the female would nip at the male's neck. The exterior exhibit does not easily allow vocalizations to be heard, but an occasional whining was noted. The whole exchange between the pair was brief, lasting no more than five minutes. After parting, the pair went on to scent mark and face rub numerous times in the yard.

After observing these behaviors, it was decided we would separate the wolves once or twice each week during the breeding season. Prior to this the wolves had been together continuously. We began locking one wolf inside, switching turns between the male and female. There is an introduction door that allowed the wolves visual contact, but no physical contact. This procedure was carried out from mid-October to early December. Once again no breeding was observed, but we began preparations for pups.

The Den

The den box is located in the first holding cage. The box is 6' x 3' x 3' with a 20" x 30" door. An inside panel allows for additional privacy. The female must turn left then slightly right to enter the main den area. The box has a cover, with an enclosed camera mounted directly above the main den area (Figure 5). The front of the den cage is covered with bamboo fence as is the security door leading into the wolf holding cages. The television and VCR are set up in the kitchen area to allow keepers to monitor and record the den without disturbing the dam and pups. Burlap was placed over cage #6 and across the security door separating the jaguars and wolves, mainly as a visual barrier. Another den box was placed in the main yard for shelter for the male when separation became necessary.

Both wolves were given access to the den cage and den box on 1 January, 1994. They were interested, but Lita occupied the box first and monopolized it. We began recording at night for four to six hour periods (usually we just recorded the female resting or sleeping in the den box). On two occasions she growled, but the male was never recorded entering the box.

As noted earlier, we never did observe any copulation, but a weight gain in the female became obvious. With no date to calculate gestation, we were prepared for the unannounced arrival of pups. We continued to record at night from 3 January, 1994, until 12 January. Lita began spending more time in the box both during the day and night, but she continued to shift normally allowing keepers to perform routine maintenance.

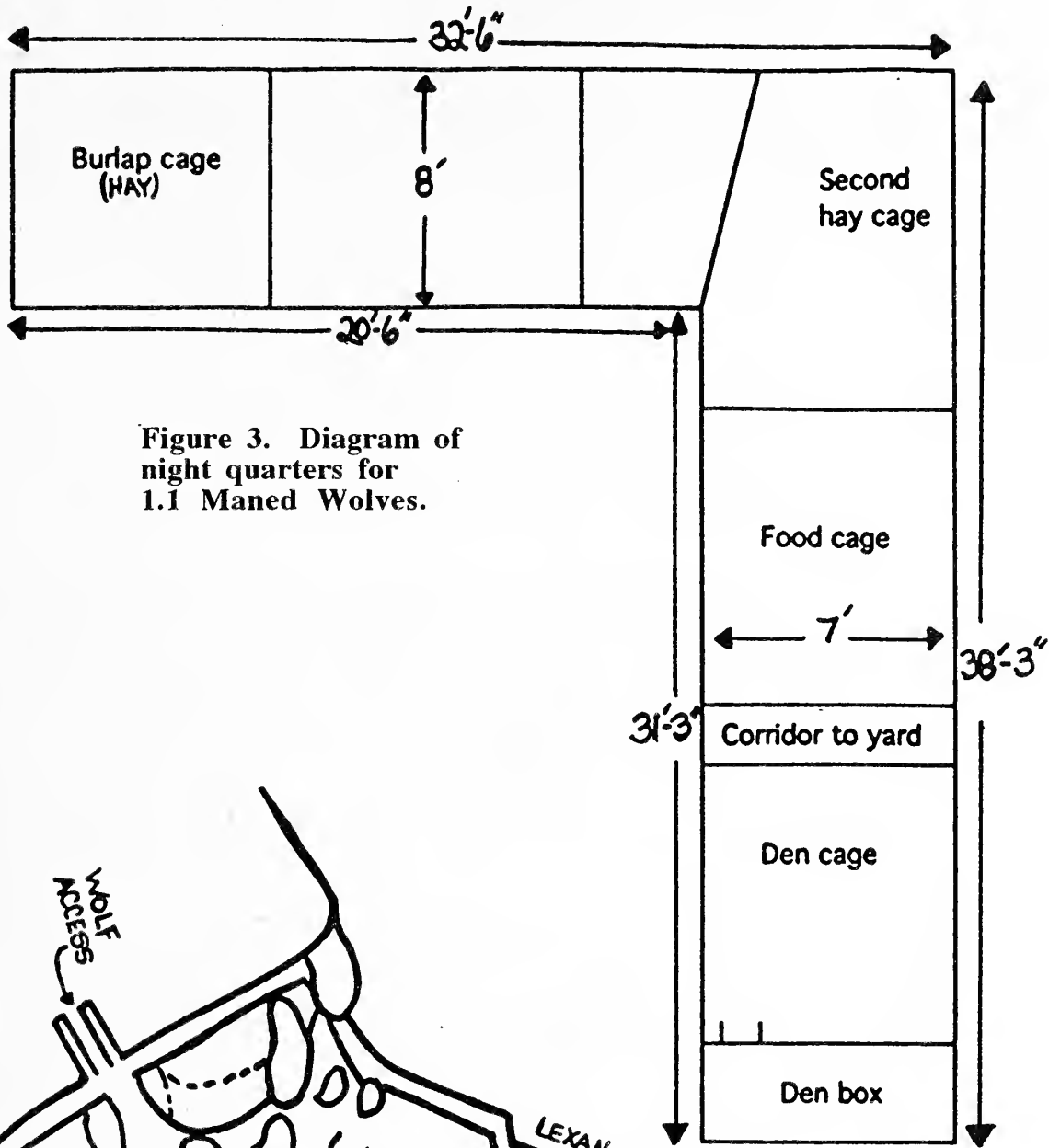


Figure 3. Diagram of night quarters for 1.1 Maned Wolves.

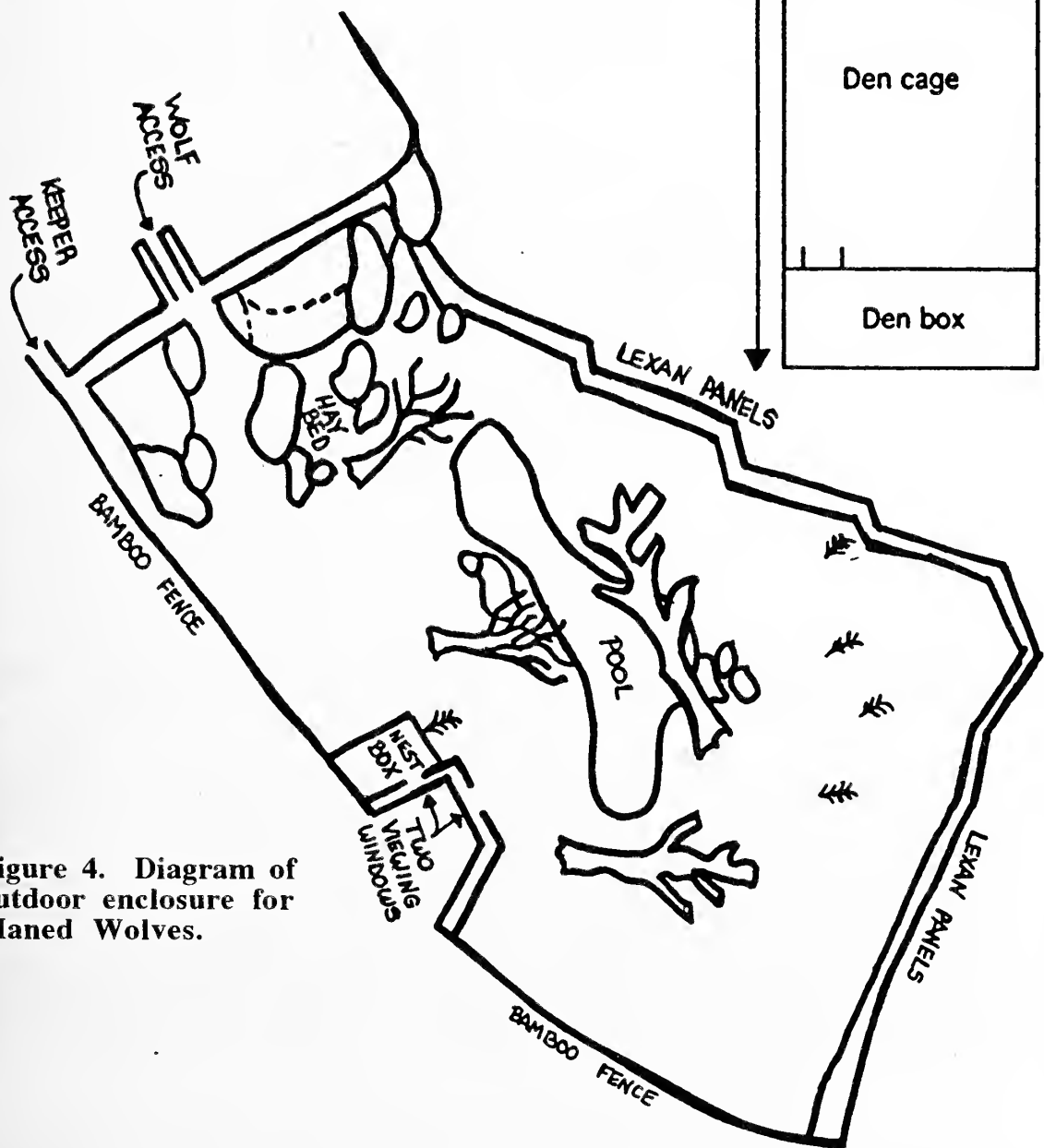


Figure 4. Diagram of outdoor enclosure for Maned Wolves.

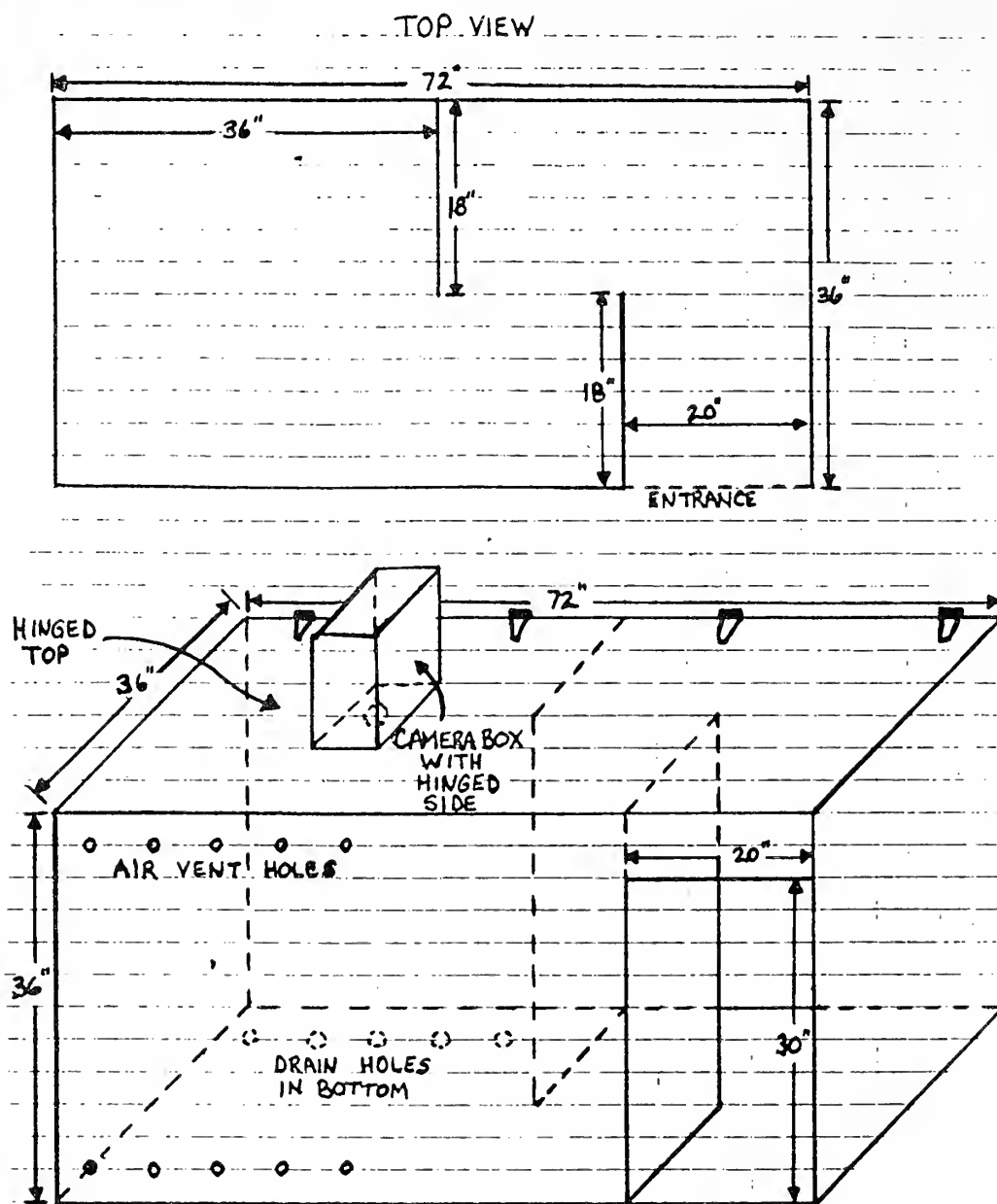


Figure 5. Den box used by 0.1 Maned Wolf.

Upon entering the area at 0700 hours on 13 January, 1994, Lita did not shift as she normally would. The camera was on, so keepers could visually check her on the television. She appeared fine. Lita remained in the den box for over two hours while the entire area was cleaned; this was very unusual behavior. Afterwards, the keeper left the building and walked around to the outside exhibit. Lita had come out. Her abdomen was very distended, the pups had obviously shifted, and a nipple on the right side was noticeable.

Lita remained with Saco until 1130 hours before returning to the den box. She was locked away from Saco at this time and four pups were born between 1245 and 1315 hours. The lights directly over the den had been extinguished, allowing Lita to feel more secure. From the birth of the pups until 4 April, 1994, Saco was locked outside on exhibit. He had access to the outside den box at night, which was well hayed down for warmth, and another hay bed during the day. Keepers were able to enter the yard for cleaning and feeding due to the docile nature of this male.

Maned Wolves at the Houston Zoo, Continued

Video Highlights of the Pups

We recorded 139 hours of videotape from 13 January, 1994 through 6 February, 1994. The majority of the tapes show the pups nursing and maternal care from Lita. The following is a chronological listing of the highlights recorded and other notable events:

- Jan. 13:** Lita spending most of the time licking her anal-genital region. Birth of one pup and cleaning of the pup.
- Jan. 19:** Lita briefly left the den. All four pups were visible.
- Jan. 20:** All four pups nursing. Ears up slightly today. Pups starting to develop some balance--not wobbling.
- Jan. 21:** Heard pups vocalizing. Lita is beginning to spend brief period of time out of the nest box.
- Jan. 29:** Pups vocalizing more.
- Feb. 5:** Pups very active/play wrestling.
- Feb. 9:** Pups up and moving well on all four legs.
- Feb. 15:** Three pups have ears standing up.
- Feb. 22:** All four pups out of den box. Lita growling at keepers. All four pups' ears are standing up.
- Feb. 24:** Pups resisting Lita's desire to move them back into den box.
- March 3:** Lita locked out of den. Pups received first vaccinations (distemper and parvovirus): sexed as 1.3, transponded, blood drawn, general physicals. Some fleas noted.
- March 9:** Began treating for fleas.
- March 19:** Saco has access to introduction door; screen size is 24" x 39" (for additional information on the introduction and behavioral changes in Saco, Lita, and the pups, see Bestelmeyer, in prep).
- March 23:** Second shots; distemper and parvovirus. 0.05cc Ivermectin® given orally, blood drawn. Pups's tails were dyed with food color for identification.
- March 30:** Lita let out with Saco in the exhibit. No problems. Pups left inside.
- April 7:** Saco brought inside and put together with Lita and pups for approximately two hours.
- April 10:** Saco together every day with pups for two hours. Saco grooming a pup today.
- April 13:** Third shots; distemper and parvovirus. 0.1cc Ivermectin® given orally, blood drawn. Shaved fur for identification on the three female pups, male left alone. One pup had right leg shaved, one had left leg shaved, one had tail shaved.
- April 14:** Saco and Lita brought inside. Left together with pups. Entire group given access to exhibit. First day outside for pups.

Conclusion

This pair of Maned wolves is very compatible and although there is no concrete evidence that separating the pair for brief periods resulted in breeding, it did stimulate their interest in each other. The methods described here resulted in breeding and in one of the first mother-reared litters in eight years in North America. This was an SSP recommended breeding and any further breedings will follow the same procedure. Lita demonstrated excellent maternal skills, and after Saco's introduction to the pups he showed strong paternal abilities. The SSP recommends breeding this pair again in 1994-95 and we anticipate leaving Saco with Lita for the birth and full development of the pups. The key to Lita's success in raising her pups was a proper den, and the security and isolation of the den area.

Acknowledgements

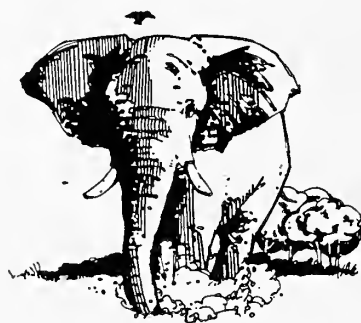
Many thanks to Stephanie Bestelmeyer for all the time she spent documenting behaviors and filming the wolves, and to Stan Mays for his work on the lineage of the Maned wolf pair. Thanks to both of them and to John Gilbert for their support on the completion of this paper.



Hunters Slay Elephants from Cynthia Moss Study

Three bull elephants, which had been part of the ongoing study by elephant expert Cynthia Moss, apparently wandered out of a game park in Kenya into neighboring Tanzania where they were shot by legally licensed, German and American safari hunters.

The dead animals were among only 10 older bulls in Kenya's Amboseli National Park, according to Moss, who had photographed and named the latest elephant killed -- Sleepy. Sleepy and two others, known as RGB and M10, each had lived more than 40 years.

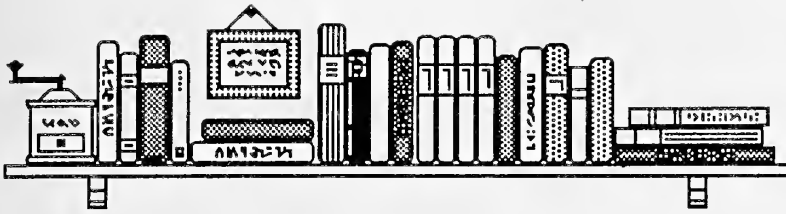


One bull was killed in August, another in October, and the latest on 5 December of 1994. Moss said the bulls were accustomed to people, and local Masai tribal members told her the hunters shot from vehicles, which would be illegal. "It's about as dangerous and difficult as shooting your neighbor's cocker spaniel," said Moss. Bill Morrill, head of the one-million member Safari Club International, said the fact that the animal left the park may indicate overpopulation.

African Wildlife Foundation officials and Moss said they do not oppose controlled sport hunting in Africa because so many Africans benefit from the revenue it generates, but both felt these killings did not fall within the category of sportsmanship. While the Tanzanian permits to hunt the elephants sold for \$4000 apiece, Kenya, which caters to tourists with cameras rather than guns, stands to lose millions in revenue if the elephant disappear. The killings have caused tension between the two countries.

The German hunters have exported the tusks of the elephants killed in August and October, but conservation officials are trying to block export of Sleepy's tusks to the United States. Ivory trade is illegal, but hunting trophies are allowed with special permits. >from *The Topeka Capital-Journal*, Dec. 19, 1994.





Book Reviews

The Last Panda

By George B. Schaller

The University of Chicago Press 1993

5801 S. Ellis Ave., Chicago, IL 60637

291 pgs, color photos, maps, appendices,
selected reading, index. \$24.95 (cloth)

Review by Richard Block

Senior Associate

World Wildlife Fund

Washington, DC

"I have endeavored to write this book as a forthright, honest account of the panda project, a biologist bearing witness, presenting facts, seeking truth, I hoped to convey the atmosphere of those years in China and sought to explore the life of a wondrous creature" (p. 250). So concludes Schaller in the opening words of the epilogue from his latest, and perhaps most moving book, The Last Panda. This is more than a natural history account or a chronicling of events between 1980 and 1985 by one of the world's foremost field biologists. It is Schaller bearing his heart and soul as he describes his efforts to understand and protect a unique species that is unintentionally being pushed to the brink of extinction.

The Last Panda is not a sequel to The Giant Pandas of Wolong (Schaller, et al., 1985), a scientific account of the research Schaller and his Chinese colleagues conducted in the panda's montane bamboo habitat. Through a narrative that is part travelogue, laced with explanations of cultural differences, sprinkled with humor, and steeped in natural history, Schaller succeeds in conveying a sense of wonder and discovery along with all the frustration and disappointment he experienced while conducting his research on the giant pandas.

The subject is giant pandas, but the lessons of this book will touch all those with an interest in or curiosity about field biology. Schaller himself notes that "Television shows and magazine articles have given the impression that field biologists lead an exciting life as they wallow with whales and associate with amiable apes. All but forgotten is the fact that many creatures are solitary and rarely seen, and that self-imposed isolation means lack of conveniences, bewildering cultures, and penance in dust, heat, snow, or rain. Most people would find little romance in field work" (p. 26). Schaller does manage to capture some "romantic" moments, however, when he describes sharing time and hot cocoa with his wife and field partner, Kay, or when he contemplates the beauty and solitude of research sites such as Tangjiahe, or when he recalls the thoughtfulness of his closest Chinese colleague in celebrating Christmas and his birthday. In addition to the warmer moments Schaller shares, he effectively uses touches of humor to color some of the hardships of camp life. "We also had a cook, though if that was his true profession many elsewhere cheered his absence; a local woman replaced him after several weeks, and a succession of other cooks followed" (p. 173).

The humor and warmth do not detract from the serious message imparted by Schaller concerning the destruction of habitat and the erosion of the wild panda population resulting from unchecked poaching. He spares no criticism in assessing the incompetence and disheartening lack of concern exhibited by some of the Chinese researchers and camp workers. His personal pain is apparent as he describes the tragic loss of pandas to poachers' snares and the misguided capture of wild pandas to fill empty spaces in proliferating captive breeding centers.

Schaller transmits the essence of his personal attachment to these alluring solitary creatures through numerous accounts of encounters with individual pandas such as Zhen-Zhen, clearly his personal favorite. The author's anecdotes about Zhen-Zhen, Han-Han, Wei-Wei, and Hua-Hua, among others, give the giant panda an identity that is essential to understanding the animal's plight. Just as Dian Fossey's names for and descriptions of the mountain gorillas in Rwanda helped rivet attention on that charismatic species

Book Reviews, *Continued*

(Fossey, 1983), Schaller has placed these black and white residents of China's Sichuan, Shaanxi, and Gansu provinces square in the public spotlight.

Whereas Schaller's field work concluded in 1985, The Last Panda brings the reader to within a year of present conservation efforts. Using the accounts of other researchers, proceedings from meetings, and policy statements from such organizations as World Wildlife Fund (WWF), the World Conservation Union (IUCN), and the American Zoo and Aquarium Association (AZA), the author has captured the essence of the progress, struggles, and conflicts that reach from China to the heart of the professional zoo community.

In recent months some progress has been made that should cast brighter light on Schaller's hope for the giant panda. In contrast to the lack of cooperation between Chinese government ministries that existed during Schaller's research, representatives of both the Ministries of Forestry and Construction have started working together. The National Conservation Project for the Giant Panda and Its Habitat, China's approved panda conservation plan, is now in the hands of the AZA, WWF, and the U.S. Fish and Wildlife Service for review.

The public attraction to giant pandas on exhibit in zoos has made them a popular drawing card for increasing attendance and generating millions of dollars in added revenues. In the last chapter "Rent-a-Pandas", Schaller condemns this practice as nothing less than satisfying greed at the cost of the well-being of the giant pandas. In 1993, the AZA announced the creation of a Species Survival Plan (SSP) for the giant panda to coordinate panda conservation efforts among participating U.S. institutions.

The AZA also assisted Chinese researchers in completing an international studbook for captive pandas, a move that could improve cooperation among zoos in China to make better use of their captive population. Schaller points out that breeding success in China appears to be below what might be expected with almost 100 animals in captivity. Because recruitment of young to the captive population did not equal mortality in that population, the author witnessed the removal of animals from the wild to maintain the size of the captive population - a discouraging trend when compounded with losses to poaching and the continuing fragmentation of the pandas' habitat.

I would hope that recent positive developments would give Schaller more reason to feel that there is a basis for hope. And despite his criticisms of WWF for not dealing with the Chinese effectively when developing the research and conservation programs, after 14 years, WWF is still there supporting conservation efforts. The Last Panda is an important book that anyone with an interest in wildlife conservation should read and ponder. What Schaller shares softens the heart to the pandas' plight, illuminates the complexities of saving wildlife, and strengthens the resolve to continue the struggle.

Fossey, D. 1983, *Gorillas in the Mist*, Houghton Mifflin Co., Boston, MA. 326 pgs.

Schaller, G.B., H. Jinchu, P. Wenshi, and Z. Jing. 1985. *The Giant Pandas of Wolong*, The University of Chicago Press, Chicago, IL. 298 pgs.

The Biology of Deer

Robert D. Brown, Editor. ©1992
Springer-Verlag
175 Fifth Avenue, NY, NY 10010
Hardcover

*Review by Sandy Elliott, Keeper
Walter D. Stone Memorial Zoo
Stoneham, MA*

The Biology of Deer is a compilation of 131 abstracts of widely varied topics from the conference proceedings of the May/June 1990 International Symposium of The Biology of Deer. It is divided into the following eight sections: Biology of Wild Populations, Animal Health and Disease, Management and Behavior of Farmed Deer, Deer Products, Reproduction, Genetics, Nutrition and Physiology, and Antler Physiology.

This book is best characterized as a reference book geared toward researchers and veterinarians. It is technical in nature and topics are highly specific. Abstract authors are

Book Reviews, Continued

mostly from either the wildlife or farming facets of deer husbandry. Only one contributor lists himself as affiliated with a zoo.

Most of the research was conducted on wild populations. Many of the topics are interesting, but I found them to have little practical application to deer husbandry at a zookeeper level. It would be a welcome addition to any zoo library as a reference book for zoo veterinarians or researchers interested in the particular topics discussed. Topics are well organized and presented in both the table of contents and the index. Wildlife biologists, zoologists and educators may also find the articles useful.

An excellent overview of the Cervidae of the world and their current status is found in the opening address entitled "Plenary Lecture: The Status of Deer in a Changing World" by David R. Klein.

The Workshops section was more practical and I found each topic here timely, and of the most interest to me as a zookeeper, particularly the articles entitled: "Endangered Species", "Disease and Immune Systems", "Artificial Breeding", "Chemical Immobilization" and "Evolution of the Cervidae".

In summary, I would recommend The Biology of the Deer for zoo and universities libraries as a reference book and for those people with an intense interest in, and background knowledge of, deer.

Artificial Habitats for Marine and Freshwater Fisheries

Edited by William, Seaman, Jr., and Lucian M. Sprague
Academic Press. 1991
525 B Street, Suite 1900, San Diego, CA 92101
Hardback, 285 pgs., \$49.95
ISBN: 0-12-634345-4

*Review by Craig S. Berg
Keeper, Aquarium/Reptile
Milwaukee County Zoo
Milwaukee, WI*

The editors intended this book to fulfill three needs:

- 1) To review the subject by presenting facts and issues that are merging in the worldwide utilization of artificial habitats in aquatic ecosystems.
- 2) To present advances in scientific investigations including ecology, engineering, socioeconomics, monitoring and assessment.
- 3) To bring the study of artificial habitats into the mainstream of fisheries science and management.

The material is presented in seven chapters each co-authored by authorities in their respective fields. Each discussion was glib and well-referenced. Topics covered include a synopsis of major world trends in the use of artificial habitats, the ecology, design and fisheries applications of artificial reefs and their socioeconomic impacts.

The editors have done an excellent job of integrating materials from such disparate topics as the economic evaluation of artificial reefs and the structural integrity of reef blocks. The information presented regarding the efforts of Japanese aquaculturists should prove to be especially useful since this information is only rarely published in English.

All in all, this book is the quality production that I have come to expect from Academic Press. This book should become a standard reference for fisheries biologists. However, it is of limited use to the zoo and aquarium community. The chapter devoted to the ecology of artificial reef habitats and fishes is mainly concerned with recruitment and succession in open waters. Therefore it would not be applicable to the closed systems which are our main concern.



Chapter News

Portland Chapter AAZK

The Portland Chapter AAZK is offering four-color enamel pins with the Bowling for Rhinos logo for \$5.00 each which includes postage. Discount is available for multiple orders.



Send requests for pins to: Portland Chapter AAZK, Metro Washington Park Zoo, 4001 S.W. Canyon Road, Portland, OR 97221 or call (503) 226-1516 Ext. 255.

Greater Houston Area Chapter

At our December meeting we elected our 1995 officers:

President.....Christina Smith
Vice Pres.....Ric Urban
Secretary.....Sheri Leavitt
Treasurer.....Christy Sky
Liaison.....Jennifer Lippold
Parliamentarian...Sheila Phillips

Our enrichment committee is moving along quickly with ideas. They are building a database to easily access enrichment ideas for the animals.

Our Chapter is raising money through can recycling and the selling of animal pictures to the zoo staff.

This year our zoo is celebrating its 75th anniversary. Our docent council is celebrating their 25th anniversary.

Our zoo also held an Asian Festival on 29 January and on 11 February the Beattle Bug Jam and their Cousins exhibit opens for the public in the George Brown Education Center.

Our Chapter wishes the San Antonio Chapter luck in their hosting of the 2nd Annual Lone Star Keeper Symposium. We will see you there.

--Jennifer Lippold, Liaison

Greater Baltimore Chapter AAZK

The Greater Baltimore AAZK Chapter welcomed in 1995 with our newly elected officers:

President....Jane McCleary
Vice Pres.....Steve Sarro
Treasurer.....Janine Dunbabin
Secretary.....Chris Bartos
Liaison.....Tony Barthel

We tried a new idea for a Christmas fundraiser this year - some of the Chapter members got together and made bread-dough ornaments to sell through the Zoo Gift Shop during their annual Zoolights Celebration. The creations ranged from giraffe and elephants to hermit crabs and geckos. We even included non-animal designs such as wreaths and holly. We also made some decorated pine-cone ornaments. They turned out pretty well, and I think we have the technique down for next year!



We had T-shirts printed with our new Chapter logo (see insert) and they turned out great! The design is printed in black on a grey shirt and is available in sizes L and XL. If anyone is interested in purchasing one of the Chapter's shirts, the cost is \$13.00 & \$3.00 shipping. Please send requests to: Greater Baltimore AAZK c/o The Baltimore Zoo, Druid Hill Park, Baltimore, MD 21217 or call Steve at (410) 532-5651.

--Chris Bartos, Secretary



The Importance of Training in Facilitating Care and Treatment of Exotic Animals: An Example

By
*Farshid Mehrdadfar, Animal Keeper
Metro Washington Park Zoo, Portland, OR*

As an animal keeper, the most stressful times in my profession have been dealing with and caring for animals that are ill or injured. Because animals are so good at masking illness and injury, one of the many challenges of my job has been to understand and recognize the early signs of illness and to properly record and report the behaviors associated with these signs. At the Metro Washington Park Zoo, we have been striving to make these times easier and less stressful for the animals in our care by training animals to cooperate with a number of veterinary procedures. This in turn makes the keeper's job easier and less stressful.

Target training through positive reinforcement has been widely used in marine mammal facilities. By modifying this method of training, we are integrating some behaviors for routine medical care of the animals such as temperature reading, blood collection, physical examination, etc. We also view this process as behavioral/environmental enrichment that both animals and keepers seem to enjoy and anticipate.

In January of 1994 I was assigned to the zoo's African exhibit. Included in this area are 1.1 Black rhinos (*Diceros bicornis*); a seven-year-old male (Pete) and a six-year-old female (Miadi). To provide better care for these animals, a training regime was begun. The objective was to make routine medical examination of the animal as stress-free as possible. In March of 1994, I invited the zoo's research committee (General Curator, Assistant Curator, Veterinarian staff, Research/Conservation Coordinator) to discuss the formal training of Pete. Protocol was set and certain goals were established, including:

1. Habituate (desensitize) the male rhino to the treatment/transfer area of his holding facility. Specifically, the goal was to have the animal calm and relaxed in this area. Prior to this training he was not comfortable in the treatment area.
2. Construction and introduction of the TARGETS (head target and body target) to the animal and establishing the BRIDGE for this training.
3. Establish the commands necessary to work with a target so that the animal reliably comes to and remains at a designated spot. (It must be noted that this training has been executed through protective contact/positive reinforcement only.)
4. Introduction of a second trainer.
5. Temperature collection (rectally). By keeping the animal still and backed up against the bars of the transfer area, a second trainer can insert the thermometer into the rectum and upon the beep of the thermometer, the temperature is read and recorded.
6. Blood collection (from ear vein). By targeting the animal and aligning him in the treatment/transfer area and keeping him stationary, the second trainer places the tourniquet on the base of the animal's ear and collects blood from the ear vein.

1. Habituate the male rhino to the treatment/transfer areas of his holding: As the primary trainer, I started the process using a half hour out of my daily shift, between 0600 hrs and 0800 hrs. The first step was getting the animal used to me and my voice. By simply observing the animal, I could better understand the body movement and different behaviors that were exhibited in his holding area. From these observations, I perceived the attention span of the animal, and established the duration of time needed for each training session.

The Importance of Training in Facilitating Care and Treatment, Continued

Shortly after this, I started acclimating the animal to the transfer/treatment area adjacent to his holding facility. My initial goal was to develop a mutual trust between Pete and myself. This trust has proven critical to the success of the entire training.

2. Construction and introduction of the targets and establishing the bridge: I started establishing a "bridge" by using a clicker and pairing the clicker noise with a reward (1/4 apple) whenever Pete approached me. The first three weeks of introduction consisted of daily 30-minute sessions. Then I introduced the head target, a 1' diameter white plastic disc (lid to a 5-gallon bucket) attached to a 3' gray PVC pipe. The purpose of the head target was to teach the animal to station. The bridge and the subsequent reward has been consistent throughout the training. First the rhino was trained to consistently position the base of his horn against the head target on command. Next, I introduced the body target, a white pool float attached to a bamboo pole. The purpose of the body target was to teach the animal to align to a particular location. With the body target ready, I began training. The object was to teach the rhino to touch the body target with his hindquarters. The command used for the head target was "Target" and the command for the body target was "Over". These two behaviors were shaped in three months.

3. Introduction of a second trainer: Addition of the second trainer was another critical point in this training process. The second trainer demonstrates the generalizability of the trained behavior. Also, it assured the animal was not cuing in on one person and therefore responding to body movement of his or her primary trainer. Without the second trainer, temperature and blood collection would be physically impossible. "While in the midst of shaping a behavior, you risk major slowdowns if you turn the training over to someone else. No matter how scrupulous one may be in discussing criteria before turning over the job, everyone's standards, reaction times, and expectations of progress are slightly different, and the net effect for the subject is to lose reinforcement until those differences can be accommodated." (Pryor, 1984). Therefore, each behavior needed to be shaped before the second trainer's assistance is solicited.

At this point, I started using the command "STEADY" to keep the animal stationary. In conjunction with the previous two commands, he will now station and remain aligned and still for as long as 10 minutes. His reliable compliance allows me (us) to take his temperature (rectally), collect blood from his ear vein, and examine his body with touch. The command "OVER" is now being performed without the actual target (by verbal command only).

Traditionally marine mammals, and more recently primates and elephants, were the primary candidates for this form of training. The Metro Washington Park Zoo staff is proving that with some modification, many of our animals can benefit from training. This type of husbandry training can also serve as a form of environmental enrichment; the rhino that I train (as well as the numerous other animals being trained by other keepers) seem to enjoy the attention received during training sessions.

The zoo community has come a long way from simply exhibiting animals for amusement. Training provides one more step toward better care and sound animal keeping. Having a team project and a closer rapport with our animals has been another decisive factor toward achieving our goals. Although training has always been a part of an animal keepers' job (training the animals to shift to and from exhibit, moving the animals to different holding areas, etc.) this level of training has given us a more expanded and formal role as animal keepers performing our daily routines. Operant conditioning training as it has developed in our situation has given us another tool to monitor the health of this animal.

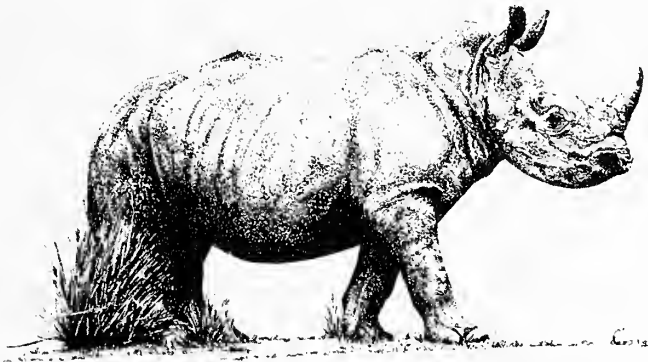
Animal Management staff were given regular information and updates throughout the entire training process. None of this would have been possible without their participation and support.

Acknowledgments

I would like to extend special thanks to Mike Keele, Assistant Curator; Dr. Jill Mellen, Research/Conservation Coordinator; Dr. Mike Schmidt, Senior Veterinarian; and Michael Illig, Senior Keeper for their advice and support. And I gratefully acknowledge the following animal keepers for their support: Sioux Marion, JoEllen Marshall, Diana Bratton, Anna Michel, Rick Yazzolino and Lee Johnson.

Reference

Pryor, K. (1984) *Don't Shoot the Dog! Shaping*, Chapter 2, pg. 61. Bantam Books, NY, NY.



Vanishing Flytraps

Admired since before the days of Darwin for their carnivorous habits, Venus' flytraps today are sold in plant stores around the world. But in the wild, the only place these small plants have ever been found is the sandy, boggy soil within 125 miles of Wilmington, NC. The unusual plant captivated early English colonists. In the 1770s the British naturalist John Ellis gave the plant its scientific name, *Dionaea muscipula*, which, literally translated, means the "mousetrap of Venus". But as the Carolina coastal plain is developed and poachers continue to dig up the plants for resale, Venus' flytraps are quietly vanishing from the wild.

"Used to be, every wooded area you went to, all over Brunswick County, there would be lots of them. Now there's none," says Milton McLean, a North Carolina Wildlife Resources Commission enforcement officer who patrols the Green Swamp Preserve for flytrap poachers. Green Swamp itself, once 200,000 acres of good flytrap habitat, is now reduced to 16,000 acres, managed by The Nature Conservancy.

For about 100 years, locals have made extra money hunting flytraps. Though they are now readily propagated through tissue culture, collecting them is cheaper. Poachers can pry the plants loose with a tire iron and make 10 to 50 cents per bulb - as much as a few hundred dollars in a day spent in the woods, according to McLean. Last summer his crew inspected Green Swamp by plane and nabbed five poachers in one day. Nurseries do a brisk business in the plants: in 1990 about 1.1 million flytraps were sent overseas, according to the World Wildlife Fund. The domestic market is estimated to be just as large.

Once reported in 21 counties - 18 in North Carolina and three in South Carolina - today the Venus' flytrap grows in only 11 counties. All 65 of the known populations are located in the transition zones between dense, shrubby bogs (called pocosins) and the sandy soil of open pine woodlands. These sandy, nitrogen-poor coastal soils no doubt contributed to the evolution of the flytrap's unusual predatory habit, since insects can serve as a good alternate source of nitrogen. *Audubon via Nature News*, Vol. 10, No. 11, *The Nature Book Society*.

L.I.N.K.
(Liaison and Information Network for Keepers)

Coordinator for the LINK System: Mark de Denus, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba, Canada R3P 0R5. (204) 986-6921 [w]; (204) 837-2916 [h]. Assistant LINK Coordinator - Ric Urban, Houston Zoological Gardens, Houston, TX, 1513 MacGregor Way, Houston, TX 77030 (713) 520-3234 [w].

Regional Coordinators

ALABAMA - Fred Alvey, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315

ALASKA - Vacancy

ARIZONA - Vacancy

ARKANSAS - Debbie Jackson or Ann Rademacher, Little Rock Zoological Gardens,
#1 Jonesboro Dr., Little Rock, AR 72205

CALIFORNIA (Northern) - Jean Lai, Oakland Zoo, 9777 Golf Links Rd., Oakland, CA 94605 and
Ruby Lara, Sacramento Zoo, 3930 West Land Park Dr., Sacramento, CA 95822-1123

CALIFORNIA (Southern) - Vacancy

COLORADO - Vacancy

CONNECTICUT - Jeanette Nadeau, Roger Williams Park Zoo, Providence, RI 02905

DELEWARE - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA 19104

FLORIDA - Rick Smith, 5752 Stoneridge, Orlando, FL 32839

GEORGIA - Fred Alvey, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315

HAWAII - Vacancy

IDAHO - Holly Liappas, Tautphaus Park Zoo, P.O. Box 50220, Idaho Falls, ID 83405

ILLINOIS - Pat Swieca, 5710 W. Cullom Ave., Chicago, IL 60634

INDIANA - Jan Weinig, P.O. Box 197, Michigan City, IN 46360

IOWA - Carla Wieser, Omaha's Henry Doorly Zoo, 10th St. & Deer Park Blvd., Omaha, NE 68107

KANSAS - Vacancy

KENTUCKY - Scott Wright, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109

LOUISIANA - Rhonda Votino, 3535 Houma Blvd., Apt. 109, Metairie, LA 70006

MAINE - Jeanette Nadeau (see addresses under CT)

MARYLAND - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA

MASSACHUSETTS - Jeanette Nadeau (see addresses under CT)

MICHIGAN - Tim Sampson, John Ball Zoo, 1300 W. Fulton, Grand Rapids, MI 49504

MINNESOTA - Tim Hill, Minnesota Zoological Gardens, 13000 Zoo Blvd., Apple Valley, MN 55124

MISSISSIPPI - Jeannie Frazier, Jackson Zoological Park, 2918 W. Capitol, Jackson, MS 39209

MISSOURI - Vacancy

MONTANA - Holly Liappas (see address under Idaho)

NEBRASKA - Carla Wieser (see address under Iowa)

NEVADA - Patricia Simonet, Wildlife Safaris, P.O. Box 6735, Incline Village, NV 89450

NEW HAMPSHIRE - Jeanette Nadeau (see addresses under CT)

NEW JERSEY - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460

NEW MEXICO - Vacancy

EAST NEW YORK - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460

WEST NEW YORK - Alan Baker, Burnet Park Zoo, 500 Burnet Park Dr., Syracuse, NY 13204

NORTH CAROLINA - Lucy Segerson, North Carolina Zoo, Rt. 4, Box 83, Asheboro, NC 27203

NORTH DAKOTA - Bob Debets, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba
Canada R3P 0R5 (204) 986-6921 [w]

OHIO - Scott Wright, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109

OKLAHOMA - Debbie Jackson or Ann Rademacher (see addresses under AR)

OREGON - Anna Michel, Washington Park Zoo, 4001 SW Canyon Rd., Portland, OR 97221

PENNSYLVANIA - Theresa Maas, Philadelphia Zoo, 3400 W. Girard, Philadelphia, PA 19104

RHODE ISLAND - Jeanette Nadeau (see addresses under CT)

SOUTH CAROLINA - Lucy Segerson, North Carolina Zoo, Rt. 4, Box 83, Asheboro, NC 27203

SOUTH DAKOTA - Bob Debets (see address under ND)

TENNESSEE - Gail Karr or Cindy Pinger, Memphis Zoo & Aquarium, 2000 Galloway, Memphis, TN 38112

TEXAS - Connie Dieringer, Caldwell Zoo, P.O. Box 4280, Tyler, TX 75712

UTAH - Vacancy

VERMONT - Jeanette Nadeau (see addresses under CT)

VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104

WASHINGTON - Vacancy

WEST VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104

WISCONSIN - Wayne Hazlett, 3768 S. 89th St., Milwaukee, WI 53228

WYOMING - Holly Liappas (see address under Idaho)

DISTRICT OF COLUMBIA - Theresa Maas (see address under PA)

Province of Ontario - Vacancy

Provinces of Manitoba & Saskatchewan - Bob Debets (see address under ND)

Province of Quebec - Vacancy

Provinces of Alberta & British Columbia - Grant Tkachuk, 10139 157th St., #206, Edmonton, Alberta T5P 2T9

Atlantic Canada - Bernard Gallant, RR # 7, 1081 Ryan Road, Moncton, N.B., E1C 8Z4

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKE, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is 913-273-1980.

SENIOR KEEPER...requires two years' college-level course work, two years' experience in the care of exotic animals, or any equivalent combination of experience and training which provides the required knowledge, skill, and abilities. Will work with Maned wolves, Anteaters, and ungulates, including Asian elephant. Salary range \$17,092 - \$24,536. Must complete and submit a city Application for Employment and a Training Experience Questionnaire by 5:00 p.m. **8 March 1995**. Submit to: City of Little Rock, Personnel Dept., 500 West Markham St., Little Rock, AR 72201-1428; (501) 371-4590.

ANIMAL KEEPER/PACHYDERM DEPT.....requires two years' paid experience in exotic animal husbandry; experience dealing with elephants in a protected contact environment preferred. Knowledge of operant conditioning techniques and their practical application to animal training is desirable. Course work in biology, zoology, or related field preferred and good oral/written communication skills essential. Duties include daily animal care, exhibit maintenance, animal observation and public contact. Excellent salary and benefits. Send resumé to: Human Resources Dept. - AK, San Francisco Zoological Society, 1 Zoo Road, San Francisco, CA 94132. EOE. No phone calls please. Closing date for applications is **6 March 1995**.

ZOOKEEPER...requires one year paid zoo experience or degree in related field. Applicants must be able to work well with the public and a small keeper staff in a small, children-oriented, AZA accredited zoo. Duties include animal care, exhibit maintenance, interaction with the public. Must be willing to work weekends and holidays. Pays \$8.00 to \$10.00 per hr., plus benefits. Send resumé to: Greg Owens, Curator, Happy Hollow Zoo, 1300 Senter Rd., San Jose, CA 95112.

ELEPHANT KEEPER...hands-on work with 2.0 Asian elephants. Previous experience required. Responsible for other animals as well, feeding, observations, exhibit maintenance. BS degree in biology or related field desirable. Benefits. Send resume to: Julia Parker, A.C.S., Santa Barbara Zoo, 500 Ninos Dr., Santa Barbara, CA 93103.

SENIOR ANIMAL KEEPER...Museum of Art and Science that maintains an indoor Mini Zoo is seeking a full-time animal keeper. Duties include providing the daily care and maintenance for a collection of small mammals, birds, reptiles and fish; train and supervise student interns; assist with medical treatments; maintain animal records using ARKS; participate in education programs for school groups and the general public; and other duties as assigned by the Mini Zoo Curator. Qualifications include a B.S. degree in a natural science and at least two years' professional experience with captive exotics. Knowledge of ARKS, computer literacy, experience in caring for fish, and experience in conducting education programs desirable. Please send resumé to: Elaine Puzo, Curator, Living Collection, The Newark Museum, 49 Washington St., P.O. Box 450, Newark, NJ 07101. For more information call (201) 596-6671.

ZOO ATTENDANT II/ELEPHANTS...requires high school diploma and one years' paid experience in the care of elephants. Candidate should have a basic understanding of animal training and its importance in daily elephant handling. Must be able to work in a free contact (females) and protected contact (males) situation. Must have interpersonal skills as a member of a four-person team. Send letter, resumé, and references **by 31 March 1995** to: Wanda Smallwood, Personnel Dept., City of Fort Worth, 1000 Throckmorton St., Fort Worth, TX 76102.

APPRENTICE ANIMAL TRAINER...working with infant big cats, lesser cats, primates, bears, and many other species. Will be on stage with educational, interactive programs. Must live on site. Some traveling. All living expenses paid, vehicle provided, salary negotiable. Call Operations Manager, Seneca Interpretive Center, Seneca Rocks, WVA at (304) 567-2353. Closing date **1 April 1995**.

Opportunity Knocks, Continued

ELEPHANT KEEPER...experience in a free contact elephant management program preferred. Requires the ability to accept direction and work as a member of the team in an extensive hands-on elephant program. Must have interpersonal skills. Cover letter and resumé to: Mary Jane Bennett, Director of Human Resources, Indianapolis Zoo, 1200 W. Washington St., Indianapolis, IN 46222.

ZOOKEEPER...7-acre Central Nebraska zoo is seeking a keeper to work with a diverse collection of animals. Degree in zoology, biology, or wildlife preferred, or equivalent training and experience in a zoo related field. Salary of \$10,400 - \$11,500, plus excellent benefits. Send letter/resumé/references **by 1 March 1995** to: Cindy Jelinek, Board President, 416 N. Sheridan, Grand Island, NE 68803.

SHOW PERSONNEL... (2) positions available **1 March 1995**. Seeking individuals with a strong background in educational shows combined with competent animal handling skills. Necessary prerequisite should include basic husbandry skills, small mammal and reptile handling, the ability to interact well with the public, and some raptor handling experience is preferable. Applicant(s) may also be called upon to assist in the handling of large and small felines. Successful applicant(s) will be team players with positive attitudes. Salary is commensurate with experience. Send resumé to: Caribbean Gardens, c/o Show Manager, P.O. Box 7129, Naples, FL 33941-7129.

ANIMAL CARE SPECIALIST...requires excellent presentation/communication skills, hands-on experience with wild/exotic animals, and knowledge of animal husbandry/behavior, nutrition and zoology. Responsibilities include but are not limited to, presentation of wild/exotic animals in outreach settings, on-site educational show, daily animal care, exhibit maintenance, and record keeping. Salary \$7.00/hr., plus benefits. Send resumé to: Six Flags Magic Mountain, Animal Dept., P.O. Box 5500, Valencia, CA 91385; (805) 255-4770.

ELEPHANT KEEPER...requires at least three years of experience handling elephants. Responsibilities would include the care and maintenance of two female Asian elephants, rides and shows, as well as care of other species. Housing available. Send resumé to: Debbie Barreda, Natural Bridge Zoo, P.O. Box 88, Natural Bridge, VA 24578.



Information Please

The Ochsner Park Zoo is in the planning stages of an exhibit renovation to house our 1.1 American black bears. I am particularly interested in information and ideas regarding adequate den area requirements, i.e. dimensions, lighting, ventilation, "furniture", shifting systems, watering and feeding designs - in other words "The Basics". I would also appreciate communication of ideas for a Timber wolf shift area. We would like to add to the den house and yard to better facilitate possible separation, vaccination, examination, sampling and feeding. The zoo has 1.0 adult wolf and 1.1 8-month-old pups. An adult female wolf is to be transferred to the zoo in the spring. Please send information to: Alice Miser Schellenberger, Zoo Specialist/Park Maintenance, Ochsner Park Zoo, c/o 124 2nd St., Rm. 15, Baraboo, WI 53913. Zoo phone: (608) 356-8208.

I am looking for any information regarding the incubation of *Ctenosaurua* sp. eggs. Information desired is: what type of medium was used, ratio of substrate to water, temperature eggs were incubated at, # of days to hatch & any problems encountered. Any additional information regarding husbandry of neonates would be helpful too. Please send to: Nancy Pinatvalli, c/o Columbus Zoo, P.O. Box 400, Powell, OH 43065.



AAZK Membership Application

Name _____ check here if renewal []

Address _____

City _____ State/Province _____ Zip _____

U.S. Members

- ☐ \$30.00 Professional/U.S.
Full-time Keepers
- ☐ \$25.00 Affiliate/U.S.
Other staff & volunteers
- ☐ \$25.00 Associate/U.S.
*Those not connected with
an animal facility*
- ☐ \$50.00 or up Contributing/U.S.
Individuals
- ☐ \$50.00 or up Institutional/U.S.
*Organizations / Institutions
(requires Board approval)*

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- ☐ \$35.00 Professional/Canada
Full-time Keepers
- ☐ \$30.00 Affiliate/Canada
Other staff & volunteers
- ☐ \$30.00 Associate/Canada
*Those not connected with
an animal facility*
- ☐ \$55.00 or up Contributing/Canada
Individuals
- ☐ \$55.00 or up Institutional/Canada
*Organizations / Institutions
(requires Board approval)*

International Members

- ☐ \$40.00 International
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- ☐ \$20.00 Library
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established libraries*

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Zoo Address _____

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Name on card _____ Expiration Date _____

Signature _____

Mail this application to : AAZK Administrative Offices, Topeka Zoo, 635 S.W. Gage Blvd., Topeka, KS 66606-2066 U.S.A. Make checks/money orders payable to AAZK, Inc. Must be in U.S. FUNDS ONLY.

Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

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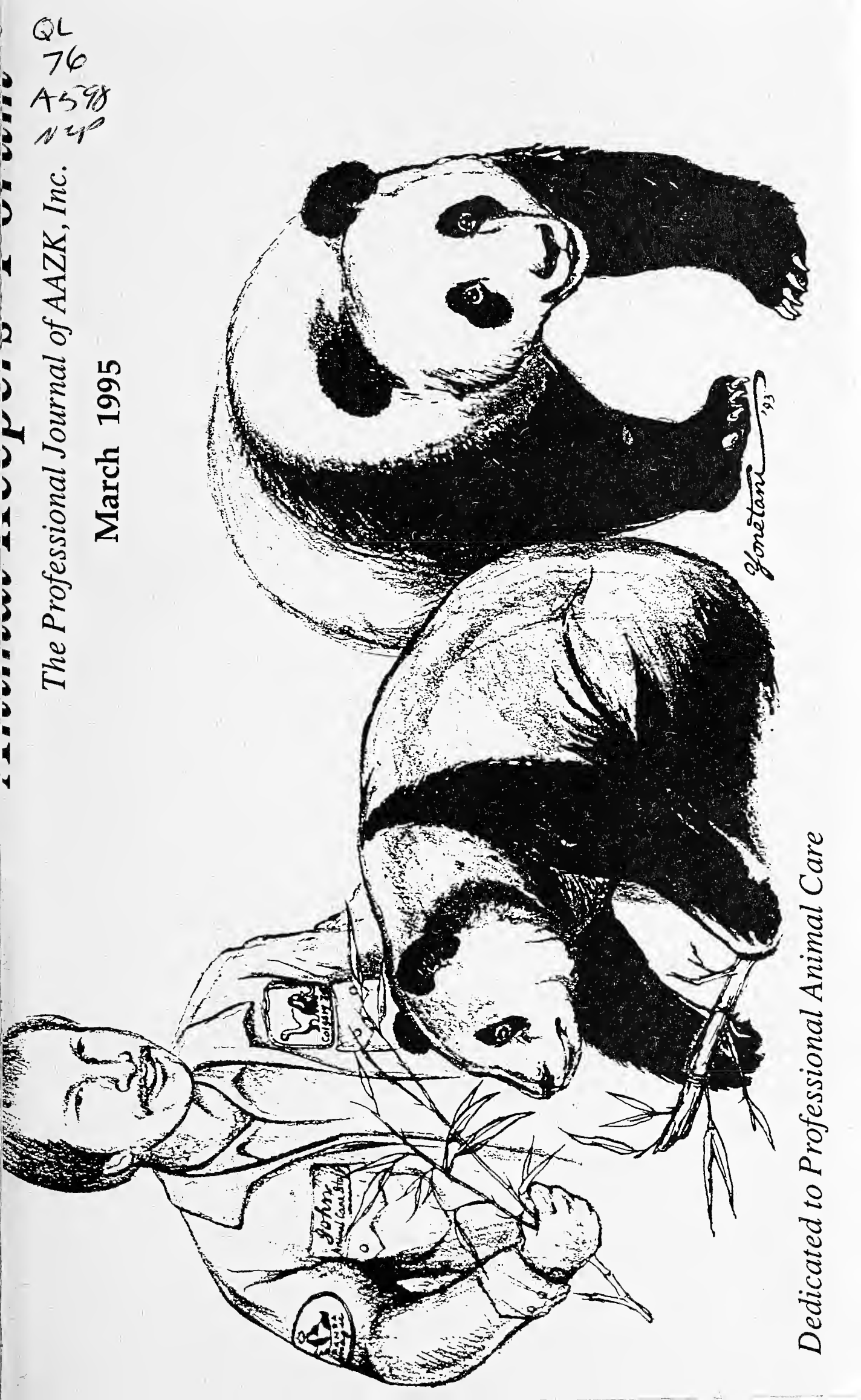
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The Professional Journal of AAZK, Inc.

March 1995

Dedicated to Professional Animal Care

ANIMAL KEEPERS' FORUM, 635 S.W. Gage Blvd., Topeka, KS 66606-2066
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Book Review Coordinators: Melba T. Brown, National Zoo & Andrea Bernee, Chaffee Zoological Garden
Legislative Outlook Column Coordinator: Vacancy

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March 1995
Volume Twenty-two
Number Three

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AAZK PUBLICATIONS - CONTINUING DATA COLLECTION

Zoo Infant Development Project -

Teri Maas/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Kim Livingstone, L.A. Zoo (Passerines)

Jeanne Bocconcelli, Newark Museum Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Grand Rapids, MI



printed on recycled paper

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Information for Contributors

Animal Keepers's Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration.

Articles should be typed or hand-printed and double-spaced. All illustrations, graphs, charts and tables should be clearly marked, in final form, and should fit in a page size **no greater than** 15cm x 25½cm (6" x 10"). Literature used should be cited in the text (Brown, 1986) and alphabetically in final bibliography. Avoid footnotes. Include scientific name of species (as per ISIS) the first time it is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Black and white photos **only** are accepted. Color slides should be converted to black and white prints (minimum size 3" x 5") before submission. Clearly marked captions should accompany photos. Please list photo credit.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone or FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone is (913) 272-5821 Ext. 31. FAX (913) 273-1980.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the
Animal Keepers' Forum editorial staff or
the American Association of Zoo Keepers, Inc.
Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$2.00 each.

*This month's cover features Calgary Zookeeper John Creviston with the pair of Giant Pandas (*Ailuropoda melanoleuca*) for which he cared during their stay at his facility during Panda Magic '88. The artwork is by international member Yoshi. Yonetani who works for ZooDEL (Zoo Design & Education Lab) in Kobe, Japan. The Giant Panda is perhaps one of the world's most endangered mammals. These rare animals are found in only a few fragmented mountainous bamboo forests of southern China, at altitudes between 4,800 and 9,500 feet. They feed almost entirely on young bamboo leaves and shoots and because bamboo does not have much food value, Pandas must spend about 10 hours a day eating. Pandas are solitary animals with mating season occurring in the spring. Births occur in January. International cooperative efforts are underway to try and save the Panda from extinction. The first, long-term breeding loan with a North American zoo will take place soon at the San Diego Zoo. See the article on the loan in this issue of AKE. Thanks, Yoshi!*

Scoops and Scuttlebutt

Chapter Donations Help Fund Projects/Operations

The AAZK, Inc. Board of Directors and the staff at Administrative Offices would like to thank the following Chapters for their generous donations: South Florida Chapter, Miami, FL (\$75.00 unrestricted); Caldwell Zoo Chapter, Tyler, TX (\$225.00 designated for CPR Fund); and The Virginia Chapter AAZK, Norfolk, VA (\$100.00 designated for The Exhibit Design Resource Notebook project) and the Burnet Park Zoo Chapter, Syracuse, NY (\$200.00 designated for Animal Data Transfer Forms Project). Additionally, the following Chapters (as of publication date) have sent in unrestricted donations to the general operating fund of the Association along with their Recharter Packets: Lincoln Park Chapter, Chicago, IL (\$100.00); Virginia Chapter, Norfolk, VA (\$100.00); and Metro Toronto Zoo Chapter, Toronto, Canada (\$100.00).

It is most gratifying to see AAZK Chapters supporting not only specific projects and programs of the Association, but also assisting in the general operating budget. While perhaps not as glamorous as funding an AAZK publication or conservation projects, donations to the general operating budget help to pay for postage for membership AKE mailings, telephone and 800-line expenses, computer equipment maintenance contracts, mailing tape, paper clips, paper, envelopes and all the other rather mundane items needed to run the Association. Our sincere thanks to all the members of all of these Chapters for their financial support of AAZK, Inc.

Zoo Studies Program Offered

Friends University, in association with the Sedgwick County Zoo, Wichita, KS, is offering undergraduate and graduate training in zoo studies. The Bachelor's of Science is a unique, fully-accredited, 4-year program which combines course work and practical work experience at the zoo. The Masters of Science in Environmental Studies is a fully-accredited, 21-month program, with a possibility of a zoo studies emphasis for those with prior zoo experience. For further information, contact Alan Maccarone, Biology Department, Friends University, 2100 University, Wichita, KS 67213 (316) 261-5890.

Conference Proceedings in the Mail

If you ordered a copy of the 1994 AAZK Conference Proceedings from Omaha, please be aware that they have been mailed and if you have not received your copy as yet, you should very shortly. Besides those who ordered a copy of the Proceedings, copies were also sent gratis to those speakers who submitted their paper for publication. If you do not receive your copy, please check with AO. If you would still like to have a copy of the 1994 Conference Proceedings, we have a limited number of extra copies available for \$20.00 for AAZK members and \$25.00 for non-members. These prices include domestic postage. Orders outside the U.S. should add \$3.00 for postage.

Nutrition Advisory Group to Meet in Toronto

The first annual meeting of the AZA Nutrition Advisory Group (NAG) will be held 1-2 May 1995. Co-hosted by the Metro Toronto Zoo and the University of Guelph, Dept. of Animal and Poultry Science, the meeting's theme will be "The Role of Nutrition in Wildlife Conservation". Program will include paper sessions, keynote speakers, poster sessions and the following workshops: April 30th (included in conference registration fees) "Bat Nutrition Workshop" - for info contact John Seyjagat, The Lube Foundation, tel: (904) 485-1250; FAX (904) 485-2656; "Commissary Management Workshop" - for info contact Barb Toldes, Philadelphia Zoo, tel: (215) 243-1100 Ext. 253; FAX (215) 243-0219. For further information and registration contact: Dr. Eduardo V. Valdes, Metro Toronto Zoo, P.O. Box 280, West Hill, Ontario, Canada M1E 4R5; tel: (416) 392-5900; FAX (416) 392-4979.

In the Aftermath of the Earthquake---News from Kobe

We are very happy to report that Yoshi Yonetani, international AAZK member and frequent cover artist for AKE survived the devastating earthquake which hit Kobe, Japan in January. His home was seriously damaged and, like many of his fellow countrymen, Yoshi lost most of his personal possessions. His workplace, ZooDEL (Zoo Design and Education Lab) was also heavily damaged and is currently shut down. Most of the zoo information, etc. that Yoshi had gathered on his many trips abroad was lost. In a FAX to our office, Yoshi not only let us know of his situation, but he also wished to thank the keepers who had attempted to contact him and were concerned for his safety.

In further word about Kobe, we learned from a phone conversation with Ken Kawata, Curator/Zoo at the Belle Isle Zoo & Aquarium, Royal Oak, MI, that while the Kobe Zoo sustained some damage, none of the animal collection was lost. However, Ken reported that at the Kobe Aquarium there was severe damage and a loss of over 50% of the collection.

Legislative Coordinator Moves On, Replacement Sought

Phyl Nilson Wojcik, who has served for the past several years as Coordinator of the Legislative Outlook column, recently resigned from that position. We would like to thank Phyl for all her efforts on behalf of the column and her efforts to keep the AAZK membership abreast of the current trends relating to animal legislation. Phyl also helped keepers understand how they could be proactive in legislative matters through a workshop she presented at the Atlanta Conference in 1993. Phyl has left her position at the John Ball Zoo in Grand Rapids, MI and is currently teaching high school biology. We wish her much success in her future endeavors and thank her for her efforts on behalf of AAZK and AKE.

Phyl's resignation now leaves this position open. We would like to hear from any individuals who have an interest in keeping up with animal-related legislation and who would be willing to coordinate information on this topic for inclusion in AKE. Such an individual would need to have the time to be able to do some research on pending legislation through press releases, other conservation-oriented agencies, and by telephone. If anyone is interested they are asked to contact AKE Editor Susan Chan.



Information Please

1. We are constructing a new White-handed Gibbon Island and are looking for information regarding "catch houses" and structures to encourage brachiation.
2. We are interested also in gathering ideas about construction of predator-prey exhibits involving small cats, e.g. Margay, Serval, etc.

Please send any information, suggestions, ideas to: Judy White, Wildlife Safari, P.O. Box 1600, Winston, OR 97496. Tel: (503) 679-6761 Ext. 41.



Message from the President

The Board of Directors will hold its Midyear Board Meeting on April 23-24, 1995 at the Administrative Offices in Topeka, KS. This is the time for the Board to review goals and objectives, set policies and to ensure that we stay financially solvent. Please contact any Board member if you have any ideas, suggestions, or items for discussion. We look forward to input from the membership to help us chart the future course of the Association.

A CALL FOR PAPERS! The *Animal Keepers' Forum* is a source of husbandry articles that cannot be found in other literature. We need articles on all facets of husbandry that only you, the professional zoo keeper, can provide. All types of articles are needed to keep the AKE a viable and informational tool for the Association. behavioral studies, nutrition, training, enrichment, hand-rearing infants and many more topics can be an information source or even spark a new idea to try another tactic at another institution. If you are adverse to writing an article with the pros and cons of what worked and what didn't, even a short paragraph on "This worked for me" might help another keeper having the same problem.

Besides the topics requested above, the editorial staff have asked for articles for two special dedicated issues. Enrichment-related articles should be submitted by 1 April, 1995, while hand-rearing information is due 1 July 1995. The staff would also like to solicit articles on all husbandry aspects dealing with shorebirds for a possible special issue. Shorebird articles should be sent to AKE by 1 September 1995.

Remember, it is you, the professional zoo keeper, who is responsible for the care and maintenance of the animals entrusted to your care. We ask that you share your knowledge with the rest of your peers via our own professional journal, the *Animal Keepers' Forum*.

Janet McCoy, President
AAZK, Inc.
Metro Washington Park Zoo
Portland, OR



AAZK Announces New Professional/Contributing Members

Jennifer Carney, Utica Zoo (NY)
Karen D. Jasmin, The Baltimore Zoo (MD)
Melody Cooke, no zoo listed, Jacksonville, FL
Barbara Heidenreich, Discovery Island (FL)
Donale Kaye, Dreher Park Zoo (FL)
Jill M. Piltz, Silver Springs (FL)
Lisa S. Burtis, Knoxville Zoo (TN)
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Stacey Paisner, Cheyenne Mtn. Zoo (CO)
Randy C. Barker, Cheyenne Mtn. Zoo (CO)
Patrick D. Butler, San Diego Zoo (CA)

Edward Furumoto, Honolulu Zoo (HI)
Camille Guilbault, Mountain View Conservation Cntr. (Canada)

Renewing Contributing Members

National Zoological Park, NZP Library, Washington, DC
White Oak Conservation Center, Yulee, FL



AAZK Award Nominations Are Now Being Accepted for 1995!

The AAZK Awards Committee would like to begin accepting nominations for the **Meritorious Achievement (MA) Award** and **The Certificate of Merit for Zookeeper Education (CMZE)** to be presented at the 1995 AAZK Conference in Denver. The deadline for all award nominations is **1 June 1995**. All award nominations received after 1 June will be reviewed for 1996, so please keep this in mind when submitting your nominations.

All awards given by the AAZK do not have a minimum or maximum number offered each year. Also, if the nominees do not meet the qualifications and nominators do not follow the nomination procedures, they will not receive the award for which they were nominated. Please include scientific names of animals when they are included in the nomination of a special or outstanding breeding acknowledgment.

Please submit all nominations to:

Anna Michel, AAZK Awards Chair
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, OR 97221

MERITORIOUS ACHIEVEMENT (MA) AWARD

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Meritorious Achievement (MA) Award presented by the AAZK Awards Committee. The purpose of the award is to recognize professional members of AAZK and AAZK Chapters, in good standing in the Association, for their extra work performed outside the keeper level of performance. This includes keeper participation in AAZPA Bean Award projects, dedicating time to other zoo related projects (conservation, wildlife education and individual breeding projects) and educating others in such programs as Scout Patch Programs.

The character of the award includes: a certificate, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes: Volume 1, United States and Canada. The latter is published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The MA was established in 1982, by Mike Crocker, 1980-1985 CHAIR, as a means of recognizing work done outside of the scope of the Excellence in Zookeeping award. It is the only award presented by the awards committee that you have to be a member of the Association to receive. The award is presented at the annual AAZK National Conference.

Qualifications:

1. The nominee must be a full-time keeper and professional AAZK member employed in any North American zoo, aquarium, or related facility. In the case of an AAZK Chapter, it must be 'in good standing' having an up-to-date charter with the AAZK.
2. The nominee must have been employed at least one year on a permanent basis at a zoo, aquauium or related facility. In the case of an AAZK Chapter, it must have been active for at least one year.
3. The nominee must be nominated by his/her peers or colleagues, while supporting nominations may be submitted by other zoo, aquarium or related facility personnel. The nominators need not be from the same institution.

Nomination Procedure:

1. List name, position, institution's name, address, phone and Director, years of service in the field and the recommendation of a peer or colleague.
2. List and **document** the outstanding achievements: AAZPA Bean Award project participation, exhibits, breeding, conservation, etc.
3. The deadline for nominations is JUNE 1st of each year.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.

**CERTIFICATE OF MERIT FOR ZOOKEEPER EDUCATION
(CMZE) AWARD**

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Certificate of Merit for Zookeeper Education (CMZE) presented by the AAZK Awards Committee. The purpose of the award is to recognize individuals, institutions and organizations in the zoological community most actively promoting educational programs for zookeepers. Examples of such support are: reimbursements for formal education, keeper training courses and staff seminars.

The character of the award includes: a certificate, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes: Volume 1, United States and Canada. The latter is Elephant

EElephant

E published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The CMZE was founded by Jeff Roberts, 1976-1978 CHAIR, in 1978, to compliment the work of the AAZK Education Committee that had been formed at that time. The award is presented at the annual AAZK National Conference.

Qualifications:

1. Any staff individual, institution or organization from a North American zoo, aquarium or related facility is eligible.
2. The keeper training program must have been in existence for at least one year.

Nomination Procedure:

1. If you feel that your institution, organization or a staff individual merits such an award, please submit a letter of nomination which mentions specifically the educational programs that are offered.

1995 AAZK Award Criteria, Continued

2. Claims made should be backed up with documentation for the committee to review.
3. List the institution or organization's name, address, phone and Director.
4. The deadline for nominations is JUNE 1st of each year.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.



Gerald Durrell 1925 - 1995

The zoo world lost one of its giants on 31 January 1995 when renowned naturalist Gerald Durrell died at age 70 from complications related to a liver transplant last April. Durrell dedicated his life to endangered species and captivated readers with his witty and affectionate depictions of animal and human behavior found in his 30-plus bestsellers. Included among his many books was *My Family and Other Animals*.

Durrell started his career in 1945 when he went to the Whipsnade Zoo as a student keeper. After a year, at age 21, he used a small inheritance to pay for collector's trips to Africa and South America. Durrell later said "... it was all too much like the white slave trade, packing 25 parrots inside a small cage...I had no stomach for it." He began writing with *The Overloaded Ark* in 1952 and wrote nearly a book a year, including the novel *Rosie is My Relative* (1986) and *Golden Bats and Pink Pigeons* (1977), an account of the Jersey Zoo.

Durrell devoted his last years to the zoo he established in 1959 as a sanctuary for animals threatened with extinction. Attracting over 200,000 visitors a year, the Jersey Zoo located on the Channel Islands became the headquarters for the Jersey Wildlife Preservation Trust in 1964. The JWPT, a research and educational foundation, has more than 15,000 members worldwide. The ultimate goal of Durrell's zoo was to return the animals bred there to their native habitats. He once released near-extinct pink pigeons in a botanical garden in Mauritius.

He was not opposed to wading into the center of animal-related controversies over the moral right to "imprison" animals, saying that critics of zoos knew nothing about the art of keeping animals in captivity. "They don't know what bountiful Mother Nature is like - that you have to look over your shoulder just to exist, search for your food, protect your young. I mean, it's worse than living in Liverpool," he told the *Times* in 1992.

He compared himself to a "hairy Florence Nightingale", saying: "There are a lot of bad zoos. But when Florence Nightingale was confronted by bad hospitals, she didn't say: 'We must close them down'. She said: 'Why not make them better?' "

Gerald Durrell married his second wife Lee - a zoologist with a doctorate in the behavior of Madagascar lemurs -- in 1979. She is expected to continue Durrell's work.

He will be missed.

>excerpted in part from Reuter's News Service with thanks to AAZK Australian member Hickson Fergusson for making us aware of this information.



Understanding Our New Bylaw Changes

During the Annual Conference held in Omaha, NE, the membership ratified the wording of the new section pertaining to our new Executive Director position and its duties. The other issue raised at our meeting was the result of changes in the Internal Revenue Service (IRS) regulations regarding Unrelated Business Taxable Income (UBTI) and *Associate* level memberships in NonProfit 501(c)(3) organizations.

It is viewed as inequitable by the IRS to charge *Associate* members more than other membership levels, which is currently not the case with AAZK, Inc. If that were the case, as it is in some organizations, income from such *Associate* level memberships would fall under UBTI and thus be taxable under current federal codes. It is also viewed as inequitable not to allow *Associate* members the opportunity to participate equally with other membership categories in the Association.

In regard to serving on the national Board of Directors, serving on the Nominations & Elections Committee, and serving on the Ethics Committee - no changes are being recommended by the Bylaws Committee. These positions are relegated to *Professional* members by the right to vote as stated in our Bylaws. In the case of the Ethics Committee, its composition is made up of *Professional* members because its task is one of review by peers. The possibility of reviewing an ethics charge against a *Professional* member would mean the committee would have to be comprised of *Professional* members.

This is why at the Chapter level, which is subordinate to the National Association, an officer may be elected who is at any level of membership. It is also possible for Chapter members to vote on Chapter issues/officers even though they are not Professional members and thus ineligible to vote in national elections. This allows all levels of membership to participate in the Association. That is why Chapter Bylaws, where these issues are concerned, may differ from those of the National Association.

With the exception of those noted above, all other committee or project appointments are now proposed to be opened to all levels of membership. The Board Overseer or Board of Directors will still employ the same review process in making such appointments, i.e. the applicants must be a "member in good standing" of the Association. Such appointments are also made with an effort toward matching up members with committees or projects that appear to be in their expressed area of expertise.

A formal proposal about these changes will be presented to the AAZK Board of Directors for their approval at their Midyear meeting. Following such approval the recommended changes would be presented to the membership for ratification at the next Annual Conference. So please keep an eye on what appears in the *AAKE* following the Midyear meeting, so you may vote with an informed opinion. Feel free to contact me if you have any questions or concerns.

Rachél Watkins Rogers, CHAIR
AAZK Bylaws Committee
San Diego Zoo/Mammal Department
P.O. Box 551
San Diego, CA 92112-0551

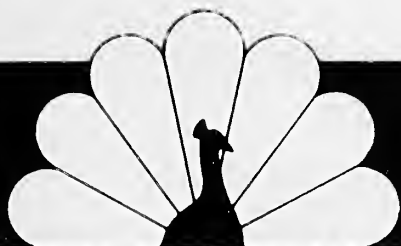


Information Please

Our recently formed enrichment committee is interested in ideas concerning environmental and behavioral enrichment for Striped hyenas and Aardwolves. If you have information pertaining to enrichment for either or both of these animals, we would appreciate hearing from you. Please contact: Allison Bureau, Mammal Dept., San Diego Zoo, P.O. Box 551, San Diego, CA 92112-0551.

The North Carolina Zoo is looking for behavioral enrichment ideas for all bird species, especially for birds in holding or quarantine areas. Also, we are more specifically interested in ideas geared towards sea birds for use in a naturalistic Alcid Exhibit. Please send any information to: RockyCoast/Puffins, c/o Vicki Roose, NC Zoological Park, 4401 Zoo Parkway, Asheboro, NC 27203.





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Coming Events

Joint Conference of the Australasian Regional Association of Zoological Parks and Aquariums (ARAZPA) and the Australasian Society of Zoo Keeping (ASZK)

April 3-7, 1995

Perth, WA

The theme is "Partnerships for Conservation". Will include paper sessions, keynote speakers, and *in-situ* visits to conservation areas. For further information contact: Eveline Read, Conference Coordinator, Perth Zoo, P.O. Box 489, South Perth WA 6151.

18th Meeting of the American Society of Primatologists

June 21-24, 1995

Scottsdale, AZ

Hosted jointly by the Primate Foundation of Arizona and Arizona State University, the meeting will be held at the Safari Resort in this Phoenix suburb. Scientific sessions convene on Thursday morning of 22 June and continue through Saturday afternoon of 24 June. Additional information is available from: Jo Fritz, Primate Foundation of Arizona, P. O. Box 20027, Mesa, AZ 85277-0027; voice: (602) 832-3780; FAX - (602) 830-7039; e-mail: 75031.3052@compuserve.com.

AAZV/WDA/AAWV 1995 Joint Conference

August 12-17, 1995

East Lansing, MI

Conference will be held jointly with the American Association of Zoo Veterinarians (AZV), the Wildlife Disease Association, and the American Association of Wildlife Veterinarians. Program will include paper sessions, workshops, student and graduate competition and poster session. For conference information contact Wilbur Amand, VMD Executive Director, 3400 W. Girard Ave., Philadelphia, PA 19104-1196; phone (215) 387-9094; FAX (215) 387-2165.

Remaining AZA 1995 Regional Conferences

AZA Central Regional (March 26-28, 1995) - For further information, contact Dawn McDonough, Sedgwick County Zoo, 5555 Zoo Blvd., Wichita, KS 67212 (316) 942-2213.

AZA Southern Regional (April 9-11, 1995) - For further information, contact Harriet James, Jackson Zoo, 2918 West Capitol St., Jackson, MS 39209 (601) 352-2585.

AZA Western Regional (April 23-25, 1995) - For further information, contact Rich Hendron, Utah's Hogle Zoo, P.O. Box 58475, Salt Lake City, UT 84108 (801) 582-1632.

AZA Northeast Regional (May 7-9, 1995) - For further information, contact Glenda Nelson, Virginia Zoo, 3500 Granby St., Norfolk, VA 23504 (804) 624-9937.

CALL FOR PAPERS

The Association of Reptile and Amphibian Veterinarians (ARAV) have issued a call for papers for their Second Annual Conference to be held in Davis, CA in October. Scientific papers will be accepted for presentation and printed proceedings on Herptile Husbandry, Reproduction, Conservation, Medicine, Surgery, and Research. Contact Michelle Willete-Frahm, DVM, Gladys Porter Zoo, 500 Ringgold St., Brownsville, TX 78520 for submission information ASAP. Complete papers preferred (except case reports) including product information, doses, references and all pertinent information. Complete papers are due **by 15 April 1995**. Veterinarians, Herptoculturists, Professional Herpetologists and students are invited to participate. Workshops on basic and advanced herptile medicine and surgery as well as presentations on the above topics will be included in the three-day event. For registration information contact Wilbur Amand, VMD, ARAV Executive Director, Box 605, 1 Smithbridge Road, Chester Heights, PA 19017.



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\$10.95	\$8.80	<u>Landscaping for Wildlife</u> - Carrol L. Henderson Guide to developing backyard, farm & woodlot habitats for wildlife in the midwest. Extensive appendix makes this useful throughout the country. Paperback.
\$6.95	\$5.60	<u>The Bat House Builders Handbook</u> - Merlin D. Tuttle & Donna L. Hensley. The definitive source for all bat house information including building plans. 104 pgs. Paperback
\$17.95	\$14.40	<u>Eyewitness handbooks - Birds' Eggs</u> - Michael Walters More than 550 birds' eggs from all over the world are identified in 2,000 life-sized photographs. 256 pgs. Flexibound.
\$60.00	\$48.00	<u>Living Snakes of the World</u> - John M. Mehrtens 413 species and 454 subspecies mentioned. 540 color photos of captive snakes & range, niche and care. 480 pgs. Hardcover.
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\$29.95	\$24.00	<u>Encyclopedia of Ornamental Grasses</u> - John Greenlee 250+ color photos by Derek Fell, includes cultural info & uses of 250 plants. 192 pgs. Hardcover.
\$19.95	\$16.00	<u>Neotropical Rainforest Mammals</u> - Louise H. Emmons 206 species and 90 genera covered in 196 individual accounts including bats and nocturnal rodents. 282 pgs. Paperback.
\$19.95	\$16.00	<u>A Neotropical Companion</u> - John C. Kricher An introduction to the animals, plants and ecosystems of the new world tropics. 450 pgs. Paperback.
\$18.00	\$14.40	<u>Audubon Field Guides</u> - 700-900 pgs each, Flexibound. Fishes, Whales & Dolphins; Reptiles & Amphibians; Fossils
\$15.95	\$12.80	<u>Audubon Field Guide</u> - paperback. Atlantic Coast Fishes; Atmosphere; Birds - East of the Rockies; Bird's Nests - Eastern; Coral Reefs; Eastern Forests; Eastern Moths; Edible Wild Plants - Eastern & Central; Mexican Birds

Previous books offered still available, some with price increases. Call (203) 576-8126 and ask for Jeanne Yuckienuz to get price update. **To order:** List the books you want with your name and address. Include shipping fee of \$2 for the first book, \$1 for each additional book, in check or money order payable to AAZK Book Sale. **U.S. FUNDS ONLY**, Please. **Send to:** AAZK Book Sale, 1875 Noble Ave., Bridgeport, CT 06610.



TAKE A GAMBLE ON COLORADO

PRE-CONFERENCE TRIP SEPTEMBER 22 & / OR 23

Our pre-conference trip is actually going to be broken down into two day trips to Colorado Springs, both of which will be leaving from and returning to Denver each day. Lodging is not included.

Friday will include a tour of the Cheyenne Mountain Zoo, including behind the scenes tours, lunch provided by the zoo, and a trip to the Garden Of The Gods, a beautiful Colorado State Park. Cost for this trip is \$20.

Saturday will include a ride on the Cog Railway to the top of Pike's Peak, lunch and touring in the village of Manitou Springs, and then a trip to Pueblo to visit the Pueblo Zoo. Cost for this trip is \$35.

CONFERENCE SEPTEMBER 24- 28

Tour the Denver Zoo's award winning Tropical Discovery exhibit, home to reptiles, amphibians, fish, mammals, and exotic plants. Take a peek at the Primate Panorama site, a new 4 acre naturalistic habitat for great apes and a variety of primates. Experience the diversity of the Rocky Mountain Arsenal, an urban wildlife refuge, and view a variety of native Colorado species. Try your luck on casino night in the historic towns of Blackhawk and Central City, which are nestled in the Rocky Mountains.

POST-CONFERENCE TRIP SEPTEMBER 29- OCTOBER 2

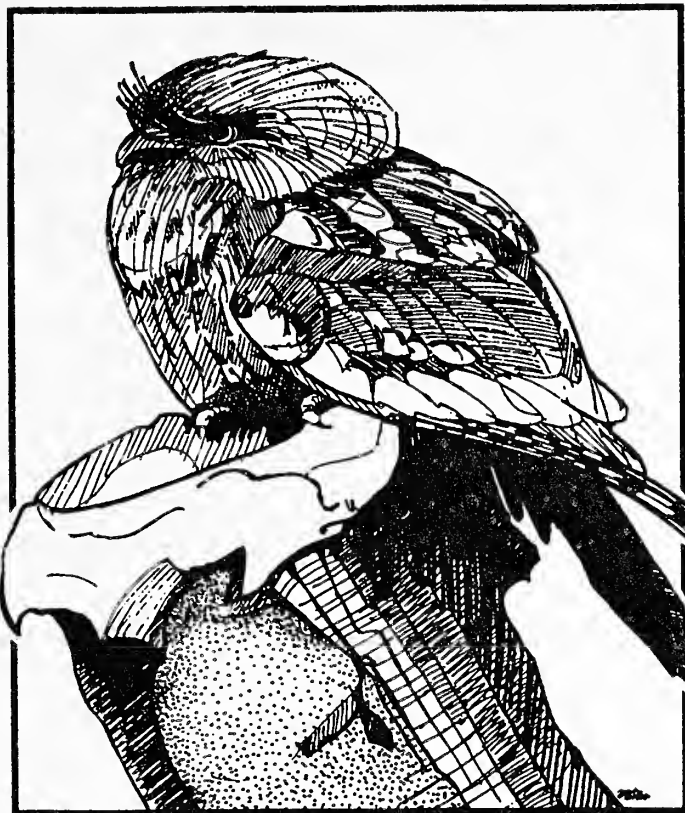
The post-conference trip will be to the Rocky Mountain National Park, one of this country's finest National Parks. Highlights will include lodging in large cabins in the nearby town of Estes Park, a tour of the famous Stanley Hotel, and lots of time to explore the park. Cost is \$150 for the whole trip, and if you would like to take the optional horseback trip, it will run \$30 more.

HOPE TO SEE YOU IN SEPTEMBER!



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The Rocky Mountain AAZK Chapter, Denver, CO is offering T-shirts made especially for AAZK by Sherrie York, internationally known wildlife artist. The price is only \$12.00, plus \$2.00 postage. Please make check or money orders payable to Rocky Mtn. AAZK Conference Committee, and mail all orders to the AAZK Chapter at the Denver Zoo, 2900 E. 23rd Avenue, Denver, CO 80205

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In this month's column we would like to focus on the safety issues associated with enrichment. New and untried ideas can be exciting and fun for animals and keepers alike, but they can also introduce hidden dangers that can turn your great ideas into disasters. Before introducing a new device, always imagine the worst scenario possible and modify the design to reduce the risk of injury or damage to a minimal level. Keep in mind, however, that some risk is unavoidable, unless the animal is maintained in a completely sterile (and inadequate) exhibit. The following checklist is reprinted from the Lab Prim. Newsletter (July 1992):

Avoid Enrichment Hazards: Ask The Following Questions

- 1) Can they get caught in it?
- 2) Can it be used as a weapon?
- 3) Can an animal be cut or otherwise injured by it?
- 4) Can it fall on a cagemate?
- 5) Can it cause gut impaction?
- 6) Can they get hung up on it (especially a youngster)?
- 7) Can they get trapped in it?
- 8) Can it break the exhibit barriers?

Puzzles and toys that are suspended by cables or chains increase the risk of entanglement and accidental asphyxia. We have found that the following modifications minimize the risk of injury from suspended objects either inside or outside the cage. Swivels at the point of attachment to the chain and to the toy make chains and cables less likely to entrap the animal. Single-link chain is less likely to kink and tangle than double-link chain. The chain should be of a size suitable to the age and strength of the animal. Chain length should be shortened to allow manipulation of the toy and minimize the possibility of forming entangling loops within the cage. Plastic sheathing reduces the flexibility of the chain and thus the risk of entanglement. A cover guard on the cage prevents chains and cables from being pulled between bars to create entangling loops. A chain suspended within the cage should be centrally positioned to prevent potential loops from forming if the chain is passed through nearby gaps in the cage. Toys should be strongly attached to the chains to prevent accidental ingestion.

A variety of collapsible and fixed perches are now available for incorporation into the caging system, but all pose a risk to the partially sedated animal, which should ideally be placed in recovery cages that are free of encumbrances, and returned to the home cage only when they are fully alert. If placed in enriched cages for recovery, they should be closely observed until ambulatory.

LAB. PRIM. NEWSLETTER, July 1992. Joseph T. Bielitzki, DVM, Senior Veterinarian, Regional Primate Research Center, University of Washington, Seattle, WA 98195.

SMALL PRIMATES - We would like to thank Jason Abels for the letter he wrote in response to an enrichment idea he saw in *AKE*. It is great to receive this kind of positive feedback on ideas--it keeps the creative juices flowing! We would love to hear from other members as well, especially any modifications or improvements of ideas from this column. Jason writes: Two African greater bushbabies have recently been placed in my care. The male is only eleven months old and the female is four years. After reviewing the article and diagram "Small Primate Feeder" in the January 1995 *AKE* issue, I wanted to try to

Enrichment Options, Continued

adapt it to enrich the galagos. The only obvious change that I made was to substitute the eggplant for an apple. This served two purposes. The first being that these particular individuals have never been all that interested in eating cut apples when mixed with their daily diet. The second is that if they were to consume some of the apple while attempting to get at their favorite food items inside the apple I would be assured that they are getting a nice supply of vitamin C. For the bushbabies I placed mealworms, moth grubs, acacia tree gum, raisins, dates, figs, apricots, and whole raw peanuts at varying depths inside holes placed in the apple. Needless to say, they loved it. The two of them spent hours working at that apple. In the morning, all the reservoirs were empty and part of the apple itself. Not only does this apparatus provide extra enrichment opportunities for the galagos, but it also allows them to exert some of their innate feeding behaviors such as extruding the tree gum and the mealworms/grubs as well as feeding from a variety of positions.

--Jason Abels, Keeper/Trainer
Pangaea Productions, Miami, FL

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--Hang feathers and pine cones for canines and cats.

--Donna Versteeg, Keeper
Walk in the Wild Zoo, Spokane, WA





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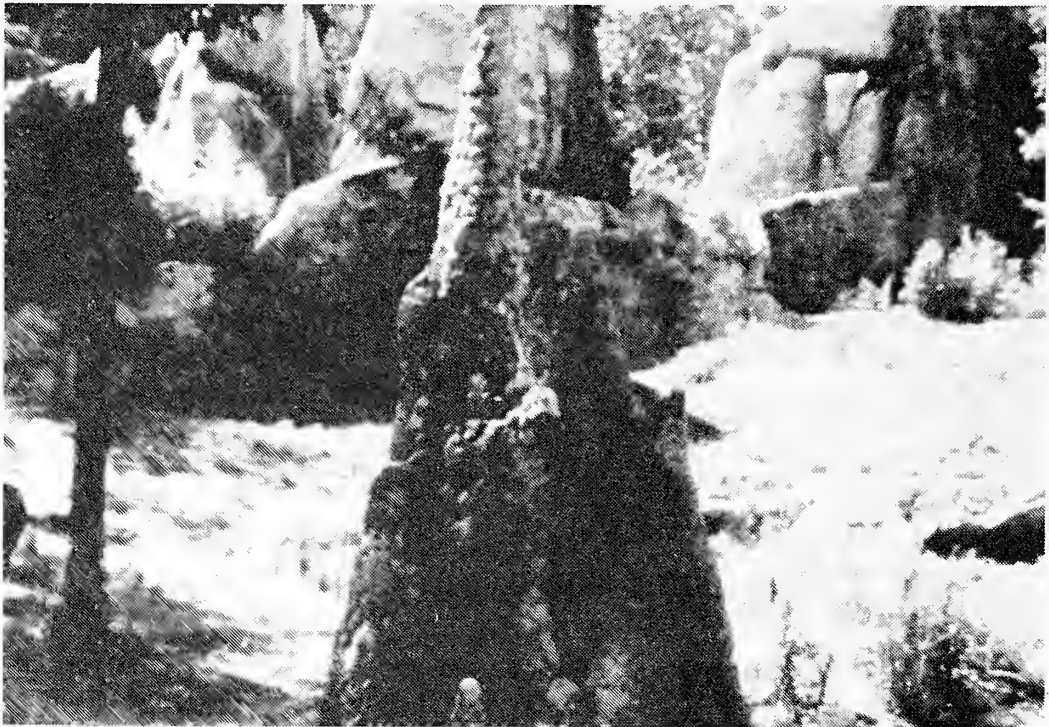
The Use of an Artificial Termite Mound for Chimpanzee Enrichment

*By Jeffrey Phillips, Mammal Keeper
North Carolina Zoo, Asheboro, NC*

In 1980 when the Chimpanzee (*Pan troglodytes*) habitat first opened at the N.C. Zoological Park some interesting enrichment features were built into the habitat. The first, in place from the onset, was an artificial termite mound. Several years later, this was complimented by the addition of an artificial fallen tree.

The artificial termite mound allows for the possibility of distributing small amounts (1 cup per adult per day) of cereals such as rice/corn Chex®, Cherrios®, bran flakes, or puffed wheat/rice, monkey biscuits from the regular diet, seeds (1 cup/adult/day) or popcorn throughout the day. This idea is utilized both for enrichment of the Chimpanzee group, as well as to demonstrate Chimpanzee feeding behavior to zoo visitors. Originally, a microcomputer/solenoid combination was employed to drop food from five food storage hoppers into ten bins at various locations in the mound. The bins are located behind small gaps through which the chimps can insert their hands and retrieve items. A sixth hopper was also used, but it was radio-controlled so that keepers lecturing at the overlooks could provide an example of feeding behavior.

Although the original concept of the termite mound was interesting, the system was in constant disrepair. The computer required many modifications and over time the radio-control option lost its range. Complicating matters were rodents and humidity. Finally, after several years in operation, the project was abandoned.



Artificial termite mound used for Chimpanzee enrichment at the N.C. Zoo
(Photo supplied by the author)

In 1985 an idea was voiced about the inclusion of an artificial fallen tree into the habitat. The fallen tree would provide numerous branches for climbing, socializing, playing or sleeping as well as two feed tubes to demonstrate Chimpanzees using tools to "find" food. The feed tubes, placed in two feed stations located inside the ends of two limbs, are made of 15.24cm (6") lengths of 1.27cm (1/2") PVC with a cap on the bottom to prevent leakage of liquids into the tree limb crevice. A variety of foodstuffs are provided such as molasses, honey, peanut butter, or even cereals and seeds. The chimps reach the food by "fishing"

Artificial Termite Mound for Chimpanzee Enrichment, Continued

with a piece of grass, a small stick or a piece of bamboo. All of the chimps enjoy this tree, using it mainly for sleeping or playing. Most of the females, as well as our youngest male are known to fish for treats.

In 1994, the termite mound project was reinvestigated. A member of the keeper staff, as well as a volunteer who had assisted in the original effort, began reviving the idea of the termite mound. Since the original system was developed, considerable advancements in electronics have been made allowing the system to be set up in much the same manner as before. A microcomputer/solenoid combination is used to drop food from six food storage hoppers into ten bins. The computer has five programs: 1) Self-test; 2) Summer - an 8-hour cycle dropping the first hopper initially and the others in sequence after one and two hour intervals; 3) winter - a 7-hour cycle dropping the first hopper initially and then dropping hoppers two through six at one hour intervals; 4) Radio - all hoppers radio-controlled; and 5) Hourly.

The Hourly program has a delay after the sequence is begun so that the first drop occurs after the zoo is open. All programs also have the option of beginning by radio-control. The programs may be changed at any time with the use of an IBM compatible computer. The drop sequence can be changed by rearranging the electrical cables connecting the microcomputer to the solenoids controlling the hoppers.



Artificial fallen tree in the Chimpanzee Exhibit at North Carolina Zoo
(Photo supplied by the author)

Finally, with all renovations complete, a date was set. The termite mound was serviced in the morning and loaded with cereal and the microcomputer was set for a radio-control drop. The older chimps, who had been present when the mound was previously active, showed interest and investigated. One member of the group, an 8-year-old female, had never been present when the mound was previously active and expressed alarm, retreating to the top of the mound and seeking reassurance from her mother. Within a short time she also began showing interest in the mound. The remaining females show the most interest in the termite mound. On rare occasions the males may also show interest.

The termite mound is now set up daily varying cereal type, using part of the diet, or even with empty hoppers. Both the termite mound and the fallen tree are part of a comprehensive enrichment program for the Chimpanzees. Other aspects of this program include the use of PVC tube feeders in the holding area, feed bags and boxes --empty or filled with a portion of the diet, as well as frozen fruits.



Chimps utilizing the artificial fallen tree at North Carolina Zoo
(Photo supplied by the author)

Acknowledgements:

I would like to thank fellow keeper Matt Randles for realizing the potential of the termite mound and our Design staff for their hard hours of work and thought that went into making these enrichment tools available to us and to the chimps. Special thanks go to Bob Wise, N.C. Zoo Volunteer, for the use of his technical knowledge and his donations of time and funds to make the termite mound operational again.



Keeper's Alert

The University Research Expeditions Program of the University of California-Berkeley has announced the following animal behavior study projects for their upcoming expeditions:

- Pelicans in Peril** - study the feeding habits and the environmental factors affecting the survival of the American White Pelican in Klamath Basin, CA June 18-Jul 1; July 23 - Aug. 5
- Predators and Prey** - monitor the movements and interaction of sheep, coyotes, and guard animals on a ranch in Mendocino County, CA to help develop an effective predator control strategy for herds June 17-30; July 2-15
- Monkey Medicine** - track the behavior and foraging habits of monkeys that use plants for medicinal purposes. Curu Wildlife Reserve, Costa Rica - several two-week sessions from June - September; call for dates.

Other Environmental and Natural Resource Conservation 1995 Expeditions include: Wetlands of Belize; Replanting Tropical Forests in Costa Rica; Marine Lakes of Palau, Micronesia; Biodiversity of Costa Rica's Tempisque Dry Forest; and Cloud Forest of the Ecuadorian Andes. No experience is necessary. Your participation and tax-deductible contribution make the research possible. Limited scholarships are available for teachers and students. For more information and a free catalog, contact: University Research Expeditions Program, Department D05, University of California, Berkeley, CA 94720. Tel: (510) 642-6586 Fax: (510) 642-6791.



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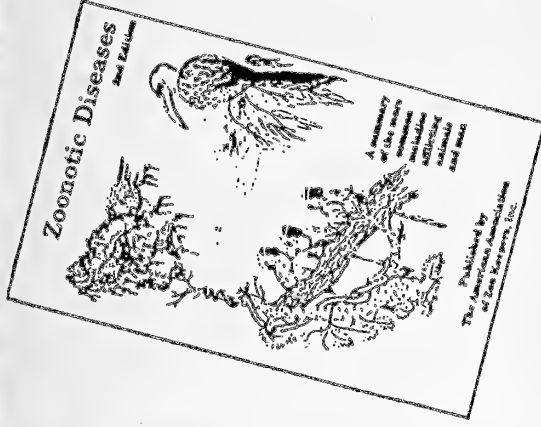
Biological Values for Selected Mammals, 3rd Edition

The Third Edition of this important reference work is published in an 8 1/2 by 11-inch format and is comb-bound. It contains information on 457 species of mammals and covers values ranging from geographic range and habitat to Circadian cycle, size and measurements, reproductive data, life expectancy, body temper-

the references utilized. Prices are: AAZK Member \$26.50 U.S. & \$32.50 - Canadian and Overseas; Nonmember - \$35.00 U.S. and \$45.00 Canadian and Overseas. Prices include postage.

Zoonotic Diseases, 2nd Edition

This 40-page reference work details the most common zoonotic diseases, offers guidelines for preventive control and covers personal hygiene and disinfection procedures. Information for each disease is presented in a text format which includes: Ethologic Agent, Means of Transmission to Man, Global Distribution, Alternate or Intermediate Hosts, Human Incubation and Human Symptoms. Cost is \$6.50 for AAZK members; \$10.00 for non-members. This price includes domestic shipping; orders outside the U.S. and Canada should add \$3.00 per copy for air mail.



Zoo and Aquarium Professionals: the History of AAZK

This 216-page volume chronicles the history of the American Association of Zoo Keepers from its beginnings at the San Diego Zoo in 1967. Included in the book is the early evolution of the Association, its projects programs and committees, the histories of its 70-plus chapters and its highly successful conservation programs - "Bowling for Rhinos" and the Ecosystem Survival Plan's Conservation Parking Meters. Cost is \$10.00 for AAZK members and \$15.00 for nonmembers. Orders outside the U.S. should add \$3.00 per copy for postage.

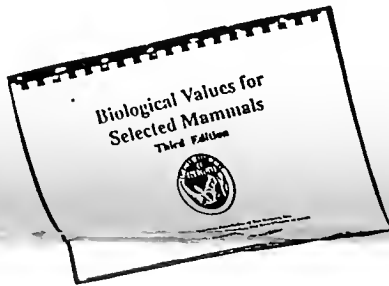


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*Edited by Harmony Frazier, LVT, Woodland Park Zoo, Seattle, WA and
Kathleen Hunt, B.A., Dept. of Zoology, University of Washington*



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Snake Sheds !!

By Michelle Acuna
Mammalogy and Ornithology Keeper
Arizona-Sonora Desert Museum, Tucson, AZ

One afternoon a keeper brought a snake shed home from work to decorate her book shelf. In moments, just as she began to wonder what her cats (*Felis domesticus*) might do, they both perked up and started sniffing the air. They found the shed easily and began investigating to the best of their ability. The shed was high up and there was not an easy place to get to it. They hovered around the book shelf attempting to knock it down and played with each other for awhile before becoming bored.

Upon hearing this story at work, we asked the Herpetology Department to pass along other snake sheds so that we could experiment. We were curious about reactions of animals that are preyed upon by snakes and those that hunt for snakes. The veterinarian did not anticipate any problems although snakes can be salmonella carriers. He thought it would be highly unlikely for the bacteria to be passed to a shed and then survive on that shed. We do remove portions with fecal material on them and, if you are still concerned, we recommend freezing them overnight.

The first animals we gave shed to were cats. We have Mountain lions (*Felis concolor*), Ocelots (*Felis pardalis*), Margays (*Felis wiedii*), Jaguarundis (*Felis yagouaroundi*), and Bobcat (*Felis rufus*). Overall, the responses were often entertaining. Many cats sniffed intently, some chewed on and ate them. Others shredded with paws and teeth and sprayed them. Sheds were hissed at and stalked, pounced on and batted, and the Bobcat not only marked the shed with facial glands and by spraying, but also marked the objects that the skins were draped over.

Almost as an afterthought, we gave some to canines too. The Gray fox (*Urocyon cinereoargenteus*) was extremely excited, alternately carrying it around in his mouth and shredding it with his paws. He also chewed it and eventually ate it. We found shredded snake shed in the Kit fox (*Vulpes macrotia*) exhibit after giving it to an old male and female.

Our Ringtail (*Bassariscus astutus*) is very shy so we were not able to observe his reaction to the shed, but the next day the shed was ripped into hundreds of pieces. Our Pack rat (*Neotoma albigula*) carried his from his off-exhibit aquarium to his exhibit "nest" and incorporated it into his bed. The male Coati (*Nasua nasua*) actually growled at his before ripping it up. Not all responses were quite as elaborate: the River otter (*Lutra americanus*) only chased his if it blew in the wind and the Black bears (*Ursus americanus*) finally investigated after they had eaten all their food. The male sniffed it and walked away and the female sniffed it and ate it. So maybe it wasn't a total bust.

We were also very curious about how some birds would react. When snakes find their way into bird enclosures some of the birds create a real ruckus. We gave shed to Beechey jays (*Cissilophya*), Magpie jays (*Calocitta formosa*), Roadrunners (*Geococcyx californianus*), and Caracaras (*Polyborus plancus*). Based on observations of other enrichment items, I was expecting vocalizations and shredding with claws and beaks. But instead, the reaction was a change in posturing and some feather ruffling and tail extension which is difficult to interpret.

Reactions that were mildly entertaining for the keepers but not quite so for the animals were observed with Javelina (*Tayassu tajacu*) and White-tailed deer (*Odocoileus virginianus*). When we threw the shed in the Javalina yard, a few came running over assuming they were getting a food treat. Javalina are well known to have poor eyesight and there wasn't a reaction until the dominant female actually made contact with the shed. All at once she ran, whirled around, clacked her teeth, and poofed out so that her hair stood on end! (Somewhat amusing, I must admit.) Some others approached with more caution, having observed the reaction of the matriarch. They too did not react until they actually contacted the shed with their noses. These reactions were similar but much less intense. Other Javalina did not notice the shed and simply milled around with the group.

Snake Sheds!, Continued

The White-tailed deer buck strutted over to his shed and snapped his head up quickly after getting a good whiff. He sniffed it again and brought his head up quickly again and then strutted away. Both the deer and the Javalina avoided the sheds after initial investigations.

I think it's important to remember that the enrichment we do need not elicit a spectacular show of behavior. It is interesting to expose these animals to a natural variable. Perhaps the fact that they lead somewhat isolated lives is the reason that they responded to the sheds at all. It is also important to not always consider stress a bad thing. Living in the wild is stressful, and lack of stress can be stressful in itself. Actually, many researchers are discovering that short-lasting acute stress is beneficial in enrichment programs. If done early in animals' lives, it may be "adaptive" in providing animals with experience necessary for coping with stress later in life. (Carlstead and Shephardson, 1994; Moodie and Chamove, 1990; Shephardson, 1994). At any rate, snake sheds can be an effective enrichment tool.

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The Hand-Rearing of a Western Lowland Gorilla *(Gorilla gorilla gorilla)*

*By Tracey Anderson, Veterinary Technician
Cheyenne Mountain Zoo, Colorado Springs, CO*

On 5 October 1992, the long-awaited birth of a Western lowland gorilla (*Gorilla gorilla gorilla*) finally took place. This was the first gorilla birth at the Cheyenne Mountain Zoo since 1976. The mother JuJu, a 12-year-old on breeding loan from the Dallas Zoo, arrived at the Cheyenne Mountain Zoo as a two-year-old. The father Barney, a 20-year-old on breeding loan from the Metro Toronto zoo, arrived at Cheyenne Mountain Zoo in July of 1991.

Because she was a hand-raised first-time mother, we were all anxious to see how JuJu would react towards her newborn. In preparation for the impending birth, JuJu and her long-time companion, a 16-year-old female named Roxie, were kept together but separated from Barney in adjoining exhibits during the night hours. An infra-red camera was used to monitor the exhibit. A 24-hour watch was initiated approximately two weeks prior to her anticipated due date. The uncomplicated birth occurred at 2300 hours. JuJu proved to be very attentive and gentle with the neonate. She was doing everything right, except that she would pull the baby away from her breast when the baby tried to nurse.

No confirmed nursing was noted for the first 48 hours. At 60 hours, it was decided to immobilize JuJu to assess the baby and position her to allow nursing. JuJu's breasts would then be pumped using an electrical breast pump to alleviate any pain or tenderness in her engorged breasts which may have been causing her reluctance to allow nursing. The hope was to leave the baby with JuJu after allowing nursing. However, the infant was very weak - too weak to nurse any substantial amount of breast milk, even with assistance. A physical examination showed that she was dehydrated and had a low body temperature of 31.1° C (87.9°) F. Blood glucose level was also critically low. Her body weight was 1.8 Kg (4 lb.). It was decided that she should be pulled and hand-reared.

Barney was kept separated from the two females until 8 October when he was reintroduced without any problems.

Asha was set up in a Isolette® at the zoo hospital with the temperature of the Isolette® maintained at between 26.6° - 32.2° C (80° - 90° F). After being warmed up, her first feeding was a combination of mother's milk, 5% dextrose, Enfamil® with iron and distilled water. She was offered 30 mls which she consumed readily. Defecation and urination were stimulated using warm, moist gauze. Feedings continued every three hours with 30 mls per feeding of Enfamil® with iron mixed with distilled water. A vitamin supplement (ViDaylin®) was mixed with the 0800 hours bottle daily. Her appetite was good and she consumed all that was offered.

On the second day of hand-feeding, the formula amount offered at each feeding was increased to 45 mls. She was urinating and defecating with and without stimulation. She was not consuming all of every bottle but her appetite was still good and she was looking and acting much brighter. By 10 October she was grabbing and holding onto items more and seemed to be focusing on specific objects. On 12 October each feeding was increased to 50 mls. per feeding. Formula quantities were gradually increased as the number of feedings were decreased. Amount and frequency of formula fed was determined by weight gains and consumption. Over the next few months her formula would continue to increase and small quantities of rice cereal would be added directly to the formula giving it texture and substance. The next step was to give her a few teaspoons of plain rice cereal and by the time the formula quantity was adjusted up to 100mls. six times a day, we began incorporating a variety of fruit and vegetable baby foods into her diet. Shortly thereafter we introduced soaked leaf eater monkey chow to her. (See feeding schedule for exact time and amounts).

Hand-Rearing of a Western Lowland Gorilla, *Continued*

On 28 October the Isolette® temperature was lowered to 23.9° - 26.7° C (75° - 80° F) as she was now maintaining her own body temperature.

During the day, Asha was still kept in an Isolette® at the zoo's hospital. Feedings were conducted by the primate staff and veterinary staff. Masks, gloves and gowns were required to be worn for all feedings and social times. Although these items were eventually eliminated, masks were always worn when the slightest sign of illness was displayed by the personnel. After hours, Asha was kept in an Isolette® at either one of the two residences on zoo grounds. She was socialized almost continuously during these evening hours.

Asha became very playful and more interested in her surroundings by mid to late October. Her first vocalizations were heard on 20 October - mostly grunting and coos prior to feeding and during diaper changes. She started laughing on 24 October.



Asha, 0.1 Western lowland gorilla hand-reared at the Cheyenne Mountain Zoo.
(Photo supplied by the author)

On 6 November, Asha was moved from the hospital to Primate World during the day. Although she was still kept in an Isolette at this time, she was kept in the gorilla service area where she had visual, olfactory and audio interaction with the 1.2 troop of adult gorillas. At about two months of age, she was maintaining her own body temperature and was outgrowing the confined area of the incubator. Asha was then kept in a playpen during the day, and at night to sleep. By mid-February, she would escape from the playpen when she was active and wanted to play, even with a playpen net over the top. At this time she was kept during the day in one of the gorilla dens which was bedded down with timothy hay. Asha was allowed to keep a stuffed toy with her in the den for security. We falsely anticipated that this would be a challenge to remove when the time came. At night she would still sleep contentedly in the playpen at either of the on-grounds residences.

When Asha was a few months old she had to be taught to hold on. She had become dependent on her handlers supporting her as she was fed which was an unconscious mistake on our part. It didn't take her long to figure out what to do. She had no problem holding on while her keeper moved about. Asha rapidly grew stronger as did her grip. Her motor skills were constantly evolving. She attempted crawling by late November, took her first real steps around Christmas time, and was knuckle-walking by 21 January 1993. Her play skills were continuously advancing.

Hand-Rearing of a Western Lowland Gorilla, Continued

Asha cut her first tooth on 24 November with the second, third and fourth following close behind. As she started cutting teeth, chewing became a favorite pastime. She had to be watched closely during this time because she was not picky about what she chose to chew on. She was offered regular (non-soaked) leaf-eater monkey chow (in addition to the soaked chow which was gradually all converted to non-soaked chow as she cut more teeth) along with a few human infant teething items to aid her in teething.

Asha was a very healthy baby. The health problems that were experienced with her were all very minor. Beginning in October, Asha had a slight bloody and mucousy vaginal discharge. This was at first thought to be caused by the diaper wipes being used. These were discontinued immediately and replaced with moist gauze. The discharge continued and was cultured with insignificant results. A consulting pediatrician informed us that the vaginal discharge is within normal limits for a (human) female infant not on mother's milk due to a hormone lacking in the formula and that this should (and did) diminish within 3-4 weeks. She had a few bouts of thrush before she was three months old. She had colds, dry skin, an infected navel, and an ear infection which were all treated and resolved easily.

By 12 May 1993, Asha was up to 180 mls. of formula three times a day. She was also being offered small pieces of apple. The variety of Baby foods, rice cereal and leaf-eater monkey chow (non-soaked) was still being given for now. The baby foods and cereal would be discontinued gradually as the raw fruits and vegetables were incorporated into the diet. Within the next few months she was being offered a variety of fruits and vegetables along with her formula and the monkey chow.

On 29 August 1993, a young female hand-reared gorilla named Kwisha was brought to CMZ on loan from the Cincinnati Zoo to be housed with Asha. Kwisha was only two months younger than Asha. When they were first introduced, they were both apprehensive. It took Kwisha a few weeks to relax and act comfortable with her new surroundings. Asha and Kwisha were competitive with each other at first. Food, security and play items, and keepers were all objects of jealousy, fighting and tantrums. But within a few months they adjusted to each other, began playing and wrestling like other siblings, and exercised their own interests and separate personalities more freely.

Kwisha was on whole milk on her arrival at CMZ. We gradually started switching Asha over to whole milk as well. Asha had a lactose intolerance which was discovered by abnormal stools and a hard distended belly. The two juveniles were given Lactaid® in their milk and there has been no further problem with this intolerance. For the first two nights, Asha and Kwisha were taken to one of the residences to be observed and interacted with to try and make the adjustment easier for them. By 31 August 1993, they were being housed together 24 hours a day in the den with limited access to the larger inside exhibit areas. Asha was trained to exit and access her den through a juvenile door. She was also being taught to respond to the commands "here" and "away" which were taught using positive reinforcement (i.e., food/verbal praise). Bottles were offered through the cage mesh without having to remove her from the exhibit at all. This was done in anticipation of the possibility of a reintroduction into the 1.2 adult troop. While Asha had a head start over Kwisha on the commands, Kwisha picked up on them quickly and both were trained by mid-September.

Asha and Kwisha each had their favorite security items. Beginning on 22 September 1993, the security toys were taken away during the day and replaced with boxes, bags, burlap and Kong® toys. The first few nights the toys were returned. On 25 September, the security items were taken away permanently. This was readily accepted by both juveniles - much to our collective surprise. During the times of socialization and feedings, the keepers would show the juveniles to the adults through dart ports in den doors and exhibit doors. These doors allowed all of the gorillas to see, hear and smell each other.

At the time of this writing (Feb. 1995) the two juveniles are successfully introduced into the 0.2 group of adults. This introduction took place on 16 November 1994. The introduction with the adult male was unsuccessful and he is temporarily separated from the now 0.4 group. JuJu gave birth to a male neonate on 15 December 1994. In an almost identical situation, she proved to be an attentive mother but refused to allow the infant to nurse. This neonate had to be pulled for hand-rearing.

Hand-Rearing of a Western Lowland Gorilla, Continued

In Conclusion

This was an incredible learning experience and an equally incredible opportunity for this author to be involved in. It was especially satisfying to be involved from the birth to the reintroduction. Asha taught us many things of importance in hand-rearing great apes as well as all animals. We now know what we did wrong and what we did right. We have learned what to focus on as the important aspects of successfully hand-rearing an infant gorilla. We do consider this a tremendous success. Wouldn't it be nice if all neonates were successfully raised by their mothers? However, when that doesn't happen, it is equally beneficial to have experiences like this that will aid in the future success for those who have to be hand-reared.

Acknowledgements

I wish to thank the keeper, curatorial and veterinary staff for all of their hard work and long hours. Especially Dale Leeds, General Curator; Tracy Bennett, Zookeeper; Conrad Schmitt (former) Assistant Curator; and Linda Schmitt, (former) Zookeeper for their assistance with night feedings and socialization. Special thanks to Dr. Mike Burton and Tracy Bennett for their assistance and guidance in the writing of this paper.

Complete Feeding Schedule for Asha

Feedings started out eight times a day. Times were: 0800, 1100, 1400, 1700, 2000, 2300
0200 and 0500 hours.

First feeding consisted of:

- 6 mls. mother's milk
- 7 mls. 5% dextrose
- 1/2 scoop Enfamil® with iron
- 1 ml. Vi-Daylin® multi-vitamins

Starting with the second feeding on Day 2 (3 days of age):

<u>DAY</u>	<u>FEEDINGS</u>
2	30 mls. Enfamil® with iron using distilled water to mix powder or premixed formula.
3	Increased to 45 mls. 8 times a day
7	Increased to 50 mls. 8 times a day
10	Increased to 55 mls. 8 times a day
12	Increased to 60 mls. 8 times a day
15	Increased to 65 mls. 8 times a day
54	Increased to 70 mls. 8 times a day
59	Decreased to 70 mls. 7 times a day - omitting the 1700 hrs feeding
76	Increase to 80 mls. per feeding but decreased to 6 times a day - omitting the 0800 hr. feeding
82	*Adjustment - 1700 hr. feed reinstated - 0800 omitted
83	Increased to 90 mls. 6 times a day - switched vitamins to Poly-Vi-Sol® 1.0ml SID

Hand-Rearing of a Western Lowland Gorilla, Continued

- 111 Increased to 100 mls 6 times a day plus 3/4 teaspoon rice cereal mixed in formula 3 times a day.
- 120 Increased rice cereal to 1-4 teaspoons mixed by package directions per day
- 131 Increased by adding 6 mls strained carrots baby food 2 times a day
- 134 Increased with 6 mls squash baby food 2 times a day
- 136 Increased to 1/3 - 1/2 jar baby food (any combo of: carrots, squash, sweet potato) per day in addition to formula and rice cereal
- 140 *Tried green beans baby food
- 143 *Tried peas baby food
- 147 *Tried applesauce baby food
- 150 *Tried peaches baby food
- 153 *Tried bananas baby food
- 159 Increased to 1/2 - 3/4 jar of any vegetable baby food variety plus 1/3 - 1/2 jar of any fruit variety per day in addition to formula and rice cereal
- 201 Increased with 3 soaked (with water) leaf-eater monkey chow biscuits
- 205 Increased to 5 soaked biscuits
- 208 Increased to 120 mls. formula 6 times a day
- 230 Increased to 1 jar vegetable baby food variety plus 1 jar fruit variety per day in addition to formula and chow - eliminated rice cereal
- 250 Increased to 180 mls. formula 2 times a day and 20 mls. 3 times a day - omitted 2300 hr. feeding
- 260 Increased by offering small pieces of raw apple in the PM
- 262 Increased to 180 mls formula 3 times a day and 120 mls 2 times a day
- 265 Increased with 1/2 jar white grape juice (baby food) per day
- 269 Increased by offering a small amount of a variety of fresh greens in the AM
- 283 Increased to 200 mls formula - decreased to 4 times a day - omitting the 1100 hr. feeding
- 362 *Greens and chow are offered in the AM (cabbage, celery, spinach, kale and broccoli) The amounts were adjusted and increased as needed from the initial offering on Day 269
- *Fruits and vegetables are offered in the PM (apple, orange, banana, carrot and potato) The amounts were adjusted and increased as needed from the initial offering on Day 260

365

*Started weaning off formula and onto whole milk - weaning completed by Day 395

746

Decreased milk to 2 times a day - AM & PM

Asha's current diet consists of 200 mls. whole milk 2 times a day (AM and PM), a total of 1/2 banana, 1/2 orange, 1/2 apple, 1/2 carrot, 1/2 potato, .23 KG (.5 lb.) assorted greens and free choice leaf-eater monkey chow biscuits up to .34 KG (.75 lb.).

The Poly-Vi-Sol® vitamins were eliminated from the diet when their formula was switched to whole milk.



Book

Reviews

Primate Responses to Environmental Change

Edited by Hilary O. Box

Chapman and Hall, London 1991

xix + 442 pgs, ISBN 0-412-29940-2

Price: \$100.00 (hardcover)

Review by Michael Seres

Research Specialist

Yerkes Primate Ctr. - Field Stn.

Emory Univ., Lawrenceville, GA

This book is organized into three major sections, which include nineteen chapters by various authors; an introduction by Box for the whole book, as well as to each section; and a Postscript as an essence of various disciplines discussed in the chapters, also by Box. The three sections present new information from general-theoretical, environmental change in nature, and from captive settings respectively. There is a 47-page-long reference section at the end of the book that provides a rather easy access to cited works in the text. Subject and species indices make it also easier to find certain topics quickly, depending on the reader's interest.

This is a very useful book, especially since there is a conscious, more than ever before, demand for providing better care and housing for various nonhuman primate species in a variety of captive environments. The goal for all of us, keepers, managers, or researchers, should be to provide the best possible life for our closest relatives, regardless of whether they are kept in zoos, labs or research institutes. This book gives us a variety of useful information discussed by numerous experts in their fields. We learn and can expand our knowledge by gaining invaluable information from psychologists, conservationists, behavioral biologists, and reproductive physiologists. The new information that this book brings to our attention can be very inspirational for many of us.

This book, however, is not a "handbook of environmental enrichment" as one might assume from the title, rather it clearly gives information about how different primate species (the book exclusively concentrates on monkeys and apes, but excludes prosimian species) respond, adapt, change, toughen and survive in their living environment whether it be captive or wild, over time and as circumstances change with habitat destruction and encroaching human populations.

There are very few books as such without mistakes, typos, or overlooked errors and this book is no exception. Some figures reproduced from previous sources are incorrect, some citations cannot be traced back. On page 13, just to mention an example, several genus

Book Reviews, Continued

names are badly misspelled, and the citation of the original work is incorrect. Unfortunately, the high price of this volume will also make it difficult for many to purchase a copy for individual use, but hopefully most of the institutional libraries will provide a copy for their staff's use and reference.

The information gathered in this book is certainly very useful and will teach us to be more aware of many aspects of primate behavior. It will also force us to be more aware of the information available for use in dealing with primates.

Ecology and Classification of North American

Freshwater Invertebrates

Edited by James H. Thorp and Alan P. Covich
Academic Press, 1991
525 B Street, Suite 1900, San Diego, CA 92101
Hardback, 911 pgs., \$69.00
ISBN: 0-12-690645-9

*Review by Craig S. Berg
Keeper, Aquarium/Reptile
Milwaukee County Zoo
Milwaukee, WI*

Since publication this book has (deservedly) become one of Academic Press' best sellers. Each of its 22 chapters is written by a specialist and covers the spectrum of freshwater invertebrates, from protozoa to arthropods. Every chapter includes sections on anatomy, physiology, ecology, culture and classification. An overview of freshwater habitats could be of use to anyone who had never taken a limnology course.

This book was intended for a "general" audience and the clarity of presentation demanded by such an intent was achieved. It is abundantly illustrated with photographs and line drawings. Care is taken by each author to avoid befuddling the reader with the marvelous diversity of "his" specialty.

Biologists and freshwater ecologists will also derive a great deal of information from this book. The bibliography compiled by each author is both current and extensive. Entomologists may feel the chapter devoted to insects is somewhat cursory but the author provides direction to more extensive sources.

This book belongs on the library shelf of any zoo, aquarium or education department. The compilation of invertebrate culturing methods alone justifies the purchase of this tome. By using this book, an education department could easily, and at modest expense, assemble an educational program which would expose children to an unseen world.

Wild Beasts

Photographs by Nicholas Bruant
Captions by Laure Oliver
Chronicle Books, 1993
275 Fifth Street, San Francisco, CA 94103
Hardback \$29.95

*Review by Jerry Harris
Retired Keeper
National Zoological Park
Washington, DC*

Wild Beasts is a vivid work which clearly illustrates Nicholas Bruant's passion for African wildlife. The black and white photographs show unusual compositions, delicate plays of light and dark tones and startling close-ups. The pictures span a 25-year period in the parks and reserves of Kenya, Tanzania and Zaire. The shots include elephants, hippos, hoofstock, reptiles, cats, primates and birds. Each animal featured has a detailed and informative caption which is placed at the end of the book.

The reader is often privy to Bruant's method of photography. For example, it is more interesting to photograph a cat by emphasizing its gaze rather than its body. The reverse is true of hippos and impalas. Bruant touches on his conservation concerns surrounding the African continent: habitat destruction, poaching, overpopulation and civil strife.

Overall, I would recommend this book to student and professional photographers as well as all who are concerned about African wildlife. This book will show many new sights.



San Diego Zoo Negotiates Panda Loan With China

Shi Shi and Bai Yun, Giant pandas (*Ailuropoda melanoleuca*) from the People's Republic of China (PRC), will soon be on their way to the San Diego Zoo. The pair, which should arrive this spring, will be sent to San Diego as part of a long-term Giant panda loan between the Zoological Society of San Diego and the China Wildlife Conservation Association.

U.S. Secretary of the Interior Bruce Babbitt in a mid-January press conference announced that he had given approval for the U.S. Fish and Wildlife Service (USFWS) to issue a permit that will allow the zoo to import the pandas from China. A federal permit is required because Giant pandas are endangered and are protected under the Convention on International Trade in Endangered Species (CITES).

The move comes 18 months after Babbitt first refused to grant a permit to the zoo. At that time, Babbitt said a national policy on panda importation should precede the granting of any new permits because a haphazard approach could lead to the poaching of pandas in the wild. Until new regulations are in force, the USFWS will maintain its moratorium on panda import applications. An exception was made for the permit application submitted by the San Diego Zoo because it was on file and under review before the moratorium was announced. The USFWS hopes to have the draft of a new panda import policy by late spring 1995.

The landmark panda agreement focuses a new international initiative on saving the fewer than 1,000 Giant pandas believed to remain in China's dwindling bamboo forests. Approximately 100 pandas live in zoos and breeding centers, primarily in China. The San Diego pandas will be the only pair in the United States. A single male panda is housed at the National Zoo in Washington, DC. The San Diego pandas would be the first of several Giant panda pairs loaned to North American zoos under a comprehensive panda conservation effort coordinated by the American Zoo and Aquarium Association (AZA).

The San Diego Zoo's proposed loan activities call for scientific research which will focus on behavioral and chemical studies in collaboration with scientists in the People's Republic of China. One of the objectives is to develop methods to determine if scent markings can be used to estimate population density and sex ratios of pandas in the wild. The chemical studies also could prove very important for management of Giant panda populations as their habitat becomes increasingly fragmented. The use of scent markings may provide a way to establish safe corridors through which pandas could travel to reach other protected areas.

Further, the San Diego Zoo has reached agreement with the Zoological Society of London, the Zoological Garten Berlin, the Beijing Zoo and the Fuzhou Giant Panda Research Center (PRC) to collaborate on the research activities outlined in the federal permit. The zoo also plans to coordinate its research with zoos in Madrid and Mexico City.

Highlights of the San Diego Zoo Giant Panda Loan include:

>People's Republic of China will loan two Giant pandas to the San Diego Zoo for display, breeding and scientific study

>The San Diego Zoo panda loan will be for 12 years

>The San Diego Zoo will contribute \$1 million each year to wild panda habitat protection projects spelled out in China's National Conservation Plan For The Giant Panda and Its Habitat. The China panda plan calls for doubling the number of existing panda preserves, establishing protected "wildlife corridors" connecting the panda preserves, studies of pandas in the wild, and study and breeding of pandas in zoos.



- >In cooperation with China and with other zoos and wildlife organizations worldwide, scientists at San Diego Zoo's Center for Reproduction of Endangered Species (CRES) will lead studies of Giant panda behavior and reproductive biology, both in zoos and in the wild.
- >Any baby panda born at the San Diego Zoo will belong to the People's Republic of China. Additional contributions to China's panda conservation projects will be made for each baby panda that remains in San Diego.

A PANDA WHO'S WHO

Shi Shi, a 13-year-old male Giant panda, was born in the wild in China's Sichuan Province. In March 1992 in the Qionlai Mountains, he was critically wounded with slashes on his back, face and limbs, probably from a fight with another male panda. A Chinese villager found Shi Shi, and he was rescued by the Forestry Bureau of Wenchuan County. Shi Shi, who weighs 230 pounds, was treated by veterinarians at the Wolong Giant Panda Conservation Centre. Although fully recovered now, because of the seriousness of his injuries at the time, Shi Shi wasn't able to be returned to the wild.

Bai Yun, a female Giant panda, was born at the Wolong Giant Panda Conservation Centre in central China on 7 September, 1991. She was raised by her mother, Dong Dong. Her father is most likely Pan Pan, although Wolong scientists aren't sure if Dong Dong's pregnancy was a result of natural breeding or artificial insemination.

The Wolong Panda Preserve is one of 13 nature reserves in China that are main habitats for wild pandas. The Wolong Giant Panda Conservation Centre, which features a panda breeding center and laboratory, was built in 1983 and houses approximately 20 Giant pandas.

>Excerpted from news releases from The Zoological Society of San Diego and the United States Department of the Interior January 14 & 17 1995



Return of the Aplomado Falcon

At the southern tip of Texas, along the coastal prairie and a short distance up the Rio Grande, small remnants of grasslands and thorn bush dot the countryside. Islands in a sea of agriculture, these habitats still produce the greatest diversity of native plants and wildlife in the U.S. Nevertheless, a few species, such as the Northern aplomado falcon, cannot tolerate human encroachment. In 1900, the species commonly nested in the region; but by the 1940s, only one nesting pair remained in the Lone Star State.

The pigeon-sized raptor's decline almost surely can be traced to agricultural development, wildlife control, and accumulations of DDT. Today, those trends are being reversed and the state is set for reintroduction of this cinnamon-breasted bird of prey. Working with the USFWS and Mexico's principal wildlife management agency, SEDESOL, Peregrine Fund project leader Peter Jenny is rearing and releasing Aplomado falcons bred at the Fund's Boise, ID facility - The World Center for Birds of Prey.

Twenty of 236 young falcons survived from the 1993 releases at Laguna Atacosa National Wildlife Refuge, 30 miles north of Brownsville, TX. Jenny thinks it will take releases of 25-50 birds a year over the next seven years to ensure pairing and breeding. *Wildlife Conservation via Nature News, Vol. 10, No. 9, The Nature Book Society.*



Chapter News

Burnet Park Zoo AAZK

Burnet Park Zoo Chapter had a very busy and productive 1994. We did a membership "drive" and gained several new members from the keeper staff, docents, and two members from the Utica Zoo!

We had four lunch seminars: Glen Johnson did a presentation on his field research on the endangered Massasauga rattlesnake; and Dr. Anne Baker, our Zoo Director, gave a talk explaining all the committees of AZA (SSP, TAG, etc.). Keepers Debbie Roth and Peg Louer gave "dress rehearsals of the papers they presented at the National Conference in Omaha. Funds raised by our Chapter helped with the major travel expenses for the conference.

In June we participated in Bowling for Rhinos and were very successful. In December we ran a booth and bonfire during the zoo's annual holiday lights festival. We sold hot chocolate, gingerbread cookies, wildlife notecards, and our own T-shirts and buttons ("If elves had reindeer..." with a picture of our Reeve's muntjac). We also had a "Croaker" at a local bar to raise additional funds. Liz Balko did a presentation on her field research on the lemurs of Madagascar and several of the bar patrons watched and learned despite themselves.

Other fund raising projects include can and bottle recycling, "Tour with a Keeper" and "Sponge-a-Keeper" raffles at zoo picnics, patches, T-shirts, and Burger Bucks. Money raised goes toward sending keepers to the National Conference, funding grants for local wildlife research projects, and funding educational projects including outreach programs and an exhibit about zoo keepers.

Our new slate of officers for 1995 is:

President.....Debbie Roth
Vice Pres.....Peggy Louer
Secretary.....Kate Hannon
Treasurer.....Jeff Hewitt

Additionally we have liaisons for the docents and Board of Directors of the

Friends of the Zoo. We look forward to a great and exciting 1995!

--Charlotte Tagtmeyer, former Secretary

Omaha AAZK Chapter

In December elections were held and the results are as follows:

President.....Bob Lastovica
Vice Pres.....Gary Pettit
Secretary.....Carla Wieser
Treasurer.....Larry Lacoma
Chapter Liaison.....Jay Tetzloff

The Omaha Chapter is trying to move on after hosting the National Conference. We want to keep the intensity that it takes to host a conference and turn that focus into local activities and conservation.

In our January meeting, Dr. Corrine Brown, one of our veterinarians, spoke about her involvement with waterfowl rehabilitation. Dr. Brown is also one of the leading people at the Omaha Zoo on animal enrichment. She helps the keepers maintain their focus on the animals.

In February, Dr. Naida Loskutoff, Henry Doorly Zoo's reproductive physiologist, spoke about her trip to Africa last year. Dr. Loskutoff's talk also showed the Chapter how easy it is to store sperm for almost any mammal.

--Jay Tetzloff, Chapter Liaison

San Diego AAZK Chapter

Our speakers for January were Marty Durham and Kim Weibel, former Wild Animal Park keepers, who spoke about their recent Hyena research project in Africa. This general meeting tied in perfectly with the tape that the Enrichment Committee at the San Diego Zoo is working on. This new committee, made up of keepers from all over the zoo, evaluates different animals, their enclosures and possible enrichment ideas.

In February, we had the Curator of Birds, Bill Toone, speak about his recent butterfly project in Costa Rica. We are donating some of our Animal Buns calendar proceeds to this conservation project.

Bowling for Rhinos is coming up again. We would like to thank Scott and Cindy Woodward for their years of hard work

Chapter News, Continued

as chairpersons of BFR in San Diego. They are turning their positions over to Ron Ringer, Ann Dahl and Dustin Black, three rhino keepers at the San Diego Zoo. We also want to thank Ron, Ann and Dustin for volunteering--we always have a great time at this fundraiser.

Our Animal Buns calendar sales have definitely slowed down. We are still selling them for our wholesale cost of \$5.00 plus \$3.50 shipping and handling. Our Chapter memberships and subscription orders to *The Keeper* have still been coming in steadily. We are proud to announce that we now have 285 subscribers and members. Subscriptions to *The Keeper* magazine are \$12.00.

Those of you already receiving the magazine should have our latest issue by now. We are always looking for new ideas, articles and comments which may be sent to the Chapter c/o San Diego Zoo, P.O. Box 551, San Diego, CA 92112.

We are also still accepting proposals for worthy conservation projects to which profits from the calendar sales may be designated. We are looking forward to spring - enjoy!

--Nicki McGahey, President

Central Florida AAZK Chapter

The Central Florida Chapter AAZK proudly presents our new logo (see inset). The Chapter's logo features the Florida panther and the West Indian manatee.



It took over two years for members to complete this project. Denise Nelson came up with the general design and Henrick Lockhart, David Nathan, and Jamie Sincage put it all together.

Our November meeting featured "open slide night", where a few of our braver members brought in slides of zoological experiences. This was an informative and humorous event. December's holiday party was held at Rossi's Pizzeria. Tim Green MC'd a humorous "Secret Santa" gift exchange.

January's meeting was held at the Brevard Zoo where Marvin Thomas gave an excellent slide presentation about his recent trip to Africa. We held our February meeting at the Central Florida Zoo and finalized most of this year's plans. (Another camp-out is included in our plans!)

Please note that our meetings have changed from the first Monday to the first Wednesday of each month.

--Rick Smith, Co-Vice President

Philadelphia Zoo AAZK Chapter

The following new officers for 1995 were elected at our December meeting:

President.....Maggie Liguori
Vice Pres.....Beth Schwenk
Secretary.....Denise McClelland
Treasurer.....Leslie Mitchell
Chapter Liaison.....Ken Pelletier

Chapter News, Continued

Minnesota Zoo AAZK Chapter

The Minnesota Zoo AAZK Chapter recently re-elected its officers for a second term. They are:

President.....Laurie Trechsel
Vice Pres.....Tim Hill
Secretary.....Pascale Tolan
Treasurer.....Karla Anderson
Chapter Liaison.....Tim Hill

This past year saw the official formation of of our Chapter and our first annual Bowling for Rhinos fundraiser. We've been active in collecting aluminum cans for recycling, and are still trying to decide which conservation organization we will help sponsor with the money we raise. We also sold San Diego Zoo's "Animal Buns" calendars.

Planning for our spring fundraiser is now underway. The event is being called Dog-O-Rama, and will involve a dog show for children, dog cart rides, demonstrations, information booths, games, food and prizes. In addition, we are starting to gear up for this year's Bowling for Rhinos scheduled for early June.

Hopefully, 1995 will be a profitable year for everyone and will see an increase in participation in Chapter activities by all of our colleagues.

--Tim Hill, Chapter Liaison



Minnesota Zoo AAZK Chapter logo design by Tim Hill. Adopted by the chapter in 1994. Logo features a Dolphin, Horned Owl, Tiger and Tapir.



The Central Florida Chapter is closing out the final stock of Petencito Zoo Patches. These patches are \$3.00 each. They were used to cover up the Sea World logo on out-of-date uniform shirts which were donated to the Petencito Zoo in Guatemala. Proceeds from this sale will help recover some of the production costs for the patches. The patch features a Jaguar on a gold background.

To order, send check or money order for number of patches desired to: Rick Smith, Sea World of Florida, Aviculture Department, 7007 Sea World Dr., Orlando, FL 32821-8097. Make checks payable to Central Florida AAZK Chapter. Be sure to include your complete return mailing address.



(Liaison and Information Network for Keepers)

Coordinator for the LINK System: Mark de Denus, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba, Canada R3P 0R5. (204) 986-6921 [w]; (204) 837-2916 [h]. Assistant LINK Coordinator - Ric Urban, Houston Zoological Gardens, Houston, TX, 1513 MacGregor Way, Houston, TX 77030 (713) 520-3234 [w].

Regional Coordinators

ALABAMA - Fred Alvey, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315

ALASKA - Vacancy

ARIZONA - Vacancy

ARKANSAS - Debbie Jackson or Ann Rademacher, Little Rock Zoological Gardens, #1 Jonesboro Dr., Little Rock, AR 72205

CALIFORNIA (Northern) - Jean Lai, Oakland Zoo, 9777 Golf Links Rd., Oakland, CA 94605 and Ruby Lara, Sacramento Zoo, 3930 West Land Park Dr., Sacramento, CA 95822-1123

CALIFORNIA (Southern) - Vacancy

COLORADO - Vacancy

CONNECTICUT - Jeanette Nadeau, Roger Williams Park Zoo, Providence, RI 02905

DELEWARE - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA 19104

FLORIDA - Rick Smith, 5752 Stoneridge, Orlando, FL 32839

GEORGIA - Fred Alvey, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315

HAWAII - Vacancy

IDAHO - Holly Liappas, Tautphaus Park Zoo, P.O. Box 50220, Idaho Falls, ID 83405

ILLINOIS - Pat Swieca, 5710 W. Cullom Ave., Chicago, IL 60634

INDIANA - Jan Weinig, P.O. Box 197, Michigan City, IN 46360

IOWA - Carla Wieser, Omaha's Henry Doorly Zoo, 10th St. & Deer Park Blvd., Omaha, NE 68107

KANSAS - Vacancy

KENTUCKY - Scott Wright, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109

LOUISIANA - Rhonda Votino, 3535 Houma Blvd., Apt. 109, Metairie, LA 70006

MAINE - Jeanette Nadeau (see addresses under CT)

MARYLAND - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA

MASSACHUSETTS - Jeanette Nadeau (see addresses under CT)

MICHIGAN - Tim Sampson, John Ball Zoo, 1300 W. Fulton, Grand Rapids, MI 49504

MINNESOTA - Tim Hill, Minnesota Zoological Gardens, 13000 Zoo Blvd., Apple Valley, MN 55124

MISSISSIPPI - Jeannie Frazier, Jackson Zoological Park, 2918 W. Capitol, Jackson, MS 39209

MISSOURI - Vacancy

MONTANA - Holly Liappas (see address under Idaho)

NEBRASKA - Carla Wieser (see address under Iowa)

NEVADA - Patricia Simonet, Wildlife Safaris, P.O. Box 6735, Incline Village, NV 89450

NEW HAMPSHIRE - Jeanette Nadeau (see addresses under CT)

NEW JERSEY - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460

NEW MEXICO - Vacancy

EAST NEW YORK - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460

WEST NEW YORK - Alan Baker, Burnet Park Zoo, 500 Burnet Park Dr., Syracuse, NY 13204

NORTH CAROLINA - Kristin LaHue, Riverbanks Zoo, P.O. Box 1060, Columbia, SC 29202-1060

NORTH DAKOTA - Bob Debets, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba Canada R3P 0R5 (204) 986-6921 [w]

OHIO - Scott Wright, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109

OKLAHOMA - Debbie Jackson or Ann Rademacher (see addresses under AR)

OREGON - Anna Michel, Washington Park Zoo, 4001 SW Canyon Rd., Portland, OR 97221

PENNSYLVANIA - Theresa Maas, Philadelphia Zoo, 3400 W. Girard, Philadelphia, PA 19104

RHODE ISLAND - Jeanette Nadeau (see addresses under CT)

SOUTH CAROLINA - Kristin LaHue, Riverbanks Zoo, P.O. Box 1060, Columbia, SC 29202-1060

SOUTH DAKOTA - Bob Debets (see address under ND)

TENNESSEE - Gail Karr or Cindy Pinger, Memphis Zoo & Aquarium, 2000 Galloway, Memphis, TN 38112

TEXAS - Connie Dieringer, Caldwell Zoo, P.O. Box 4280, Tyler, TX 75712

UTAH - Vacancy

VERMONT - Jeanette Nadeau (see addresses under CT)

VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104

WASHINGTON - Vacancy

WEST VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104

WISCONSIN - Wayne Hazlett, 3768 S. 89th St., Milwaukee, WI 53228

WYOMING - Holly Liappas (see address under Idaho)

DISTRICT OF COLUMBIA - Theresa Maas (see address under PA)

Province of Ontario - Vacancy

Provinces of Manitoba & Saskatchewan - Bob Debets (see address under ND)

Province of Quebec - Vacancy

Provinces of Alberta & British Columbia - Grant Tkachuk, 10139 157th St., #206, Edmonton, Alberta T5P 2T9

Atlantic Canada - Bernard Gallant, RR # 7, 1081 Ryan Road, Moncton, N.B., E1C 8Z4

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing dates for positions available. There is no charge for this service and phone-in or FAX listings for positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.

The following two (2) positions are available at the Gladys Porter Zoo. Send resumé to individual listed under position at this address: Gladys Porter Zoo, 500 Ringgold St., Brownsville, TX 78520.

CHILDREN'S ZOO SUPERVISOR...at Gladys Porter Zoo--full-time, working position available for qualified applicants. Additional staff includes experienced nursery supervisor and two keepers. Collection includes 75+ animals consisting of small carnivores and primates, barnyard/petting area, nursery and birds. Individual should be creative and able to transform area into educational and recreational facility for children. Prior keeper experience required; prior supervisory and/or educational experience preferred. Must be able to relocate and start by 15 May 1995. Salary in the mid-teens, plus benefits. Send resumé to: Michelle Willette-Frahm, DVM.

VETERINARY TECHNICIAN/HOSPITAL KEEPER...the Gladys Porter Zoo is seeking qualified applicants for a full-time veterinary technician/hospital keeper position. Job responsibilities include, but are not limited to: weekend and relief hospital keeper duties (cleaning, feeding, treatments, etc.), weekend and relief technician duties (clinical pathology, assisting with all procedures, radiology, etc.), MedARKS data entry and maintenance of medical records. Prior technician experience and working knowledge of MedARKS preferred. Wage in the mid-teens, plus benefits. Send resumé to: Teri Hermann, RVT.

APPRENTICE ANIMAL KEEPER...working with infant big cats, lesser cats, primates, bears, and many other species. Will be on stage with educational, interactive programs. Must live on site. Some traveling. All living expenses paid, vehicle provided, salary negotiable. Call Operations Manager, Seneca Interpretive Center, Seneca Rocks, WVA at (304) 567-2353. Closing date is 1 April 1995.

CURATOR OF BIRDS...we are currently seeking an individual to assume overall responsibility for our bird collection. In addition to cataloging, classifying, managing procuring, and exhibit design, the incumbent will establish policies and procedures for the care of birds, provide advise and consultation on the keeping of birds, develop keeper and volunteer training as well as organizing educational programs for staff and public. The Curator undertakes and publishes original research on matters relevant to birds in the collection, and prepares and reviews research proposals relating to birds. Some supervisory duties are included in the responsibilities. The successful candidate will possess a minimum Master of Science degree or equivalent amount of training and experience, a strong background in bird husbandry with research expertise that can support the management of a major bird collection. Must possess the ability to communicate effectively both orally and in writing including the preparation of research papers and reports and be able to give formal presentations to groups and individuals. Should relate easily to staff and public. Previous supervisory experience would be an asset. Salary \$48,153.00 - \$58,792.00 (Canadian) per annum. Please reply in writing by 31 March 1995, stating full qualifications and experience to: Mr. K. Thompson, Human Resources, P.O. Box 280, West Hill, Ontario, M1E 4R5 Canada.

GENERAL ZOOKEEPER/ELEPHANTS...requires a high school diploma, one year's experience with care/maintenance/training of two female African elephants plus the care and maintenance of other zoological specimens; exhibit maintenance, supportive public relations. Must establish residency with the County of Monroe in New York State. Salary \$1,550.00/mo., plus excellent benefits. Send resumé to: Sue Moran, Supervisor, Seneca Park Zoo, 2222 St. Paul St., Rochester, NY 14621-1097.

ZOOKEEPER ASSISTANT/BIRD DEPT....an opportunity to participate in incubator/brooder facilities and off-exhibit avian propagation facility. Includes care of extensive bird collection and maintenance of exhibits. Requires high school diplomas and/or biology degree or minimum of one (1) year working experience. Starting salary is \$19,302.00 per year with benefits. Submit resumé by **31 March 1995** to: Nancy Foley, Director of Human Resources, The Toledo Zoological Society, P.O. Box 4010, Toledo, OH 43609-0010.

ELEPHANT HANDLER....to work with 0.2 gentle trained Asian elephants and assisting trainer in developing new educational elephant demonstration. Will be involved in elephant care, shows, rides, as well as educational zoomobile involving other species. Elephants appear during the summer at large New England zoo, with occasional outside appearances spring and fall. Elephant experience preferred. Great position for hard worker interested in working hands-on with privately owned elephants. Salary commensurate with experience. **Position begins April 1995.** Call (508) 278-9354.

SEASONAL KEEPER/GUIDE...two (2) positions available May - October. Prior paid zoo experience preferred, volunteer experience acceptable. Applicants must be neat in appearance, have audible voice, work well with co-workers and public. Duties include, but are not limited to, giving tours to the public, all aspects of animal care. Must work with non-venomous as well as venomous reptiles. Salary - \$185.00 per week, lodging, utilities and uniforms provided. Good opportunity for paid zoo experience. Send resumé to: Soco Gardens Zoo, Jim Miller, 904 Soco Road, Maggie Valley, NC 28751. Resumés accepted until positions filled.

ZOOKEEPER...require keeper with at least two years of hands-on experience in a paid position. The candidate must have a proven ability to work with a minimum of supervision. Duties include the daily care of cleaning, feeding and observing our collection of over 100 species as well as presenting live animal shows on a scheduled basis. We are looking for a self-starter who can get along with both fellow employees and the visiting public. We offer a competitive salary and other benefits. Send resumé and references to: Vince Hall, Claws 'N' Paws Wild Animal Park, RD 6, Lake Ariel, PA 18436. Position open until filled.

The following two (2) positions are available at the Fort Worth Zoo. For either position send letter, resumé, and references to: Wanda Smallwood, Personnel Department, City of Fort Worth, 1000 Throckmorton Street, Fort Worth, TX 76102.

ZOO ATTENDANT I/PRIMATE FACILITY...requires high school diploma and two year's experience in the management of a great ape collection. Bachelor's degree, proven interpersonal/supervisory skills and experience with a variety of primate species are preferred. Responsible for staff supervision and animal care programs as well as the care of the physical plant. Must be willing to facilitate and participate in approved research programs and do some public speaking. Salary commensurate with experience. **Closing date for this position is 30 April 1995**

ZOO ATTENDANT I/ELEPHANTS...requires high school diploma and one year's paid experience in the care of elephants. Candidate should have a basic understanding of animal training and its importance in daily elephant handling. Must be able to work in a free contact (females) and protected contact (males) situation. Must have interpersonal skills as a member of a four-person team. **Closing date for this position is 31 March 1995.**

ANIMAL CARE SPECIALIST...requires excellent presentation/communication skills, hands-on experience with wild/exotic animals, and knowledge of animal husbandry/behavior, nutrition and zoology. Responsibilities include, but are not limited to, presentation of wild/exotic animals in outreach settings, on-site educational show, daily animal care, exhibit maintenance, and record keeping. Salary \$7.00/hr., plus benefits. Send resumé to: Six Flags Magic Mountain, Animal Dept., P.O. Box 5500, Valencia, CA 91385; (805) 255-4770.



AAZK Membership Application

Name _____ check here if renewal []

Address _____

City _____ State/Province _____ Zip _____

U.S. Members

- ☐ \$30.00 Professional/U.S.
Full-time Keepers
- ☐ \$25.00 Affiliate/U.S.
Other staff & volunteers
- ☐ \$25.00 Associate/U.S.
*Those not connected with
an animal facility*
- ☐ \$50.00 or up Contributing/U.S.
Individuals
- ☐ \$50.00 or up Institutional/U.S.
*Organizations / Institutions
(requires Board approval)*

Canadian Members

- ☐ \$35.00 Professional/Canada
Full-time Keepers
- ☐ \$30.00 Affiliate/Canada
Other staff & volunteers
- ☐ \$30.00 Associate/Canada
*Those not connected with
an animal facility*
- ☐ \$55.00 or up Contributing/Canada
Individuals
- ☐ \$55.00 or up Institutional/Canada
*Organizations / Institutions
(requires Board approval)*

International Members

- ☐ \$40.00 International
*All members outside U.S. &
Canada regardless of category*

Library Only

- ☐ \$20.00 Library
*Available only to
established libraries*

Zoo Affiliation (if any) _____

Zoo Address _____

Title _____

Work Area _____

☐ My check is enclosed (AAZK, Inc.)

☐ Please charge to my credit card

MASTERCARD _____ VISA _____

Card # _____ - _____ - _____ - _____

Name on card _____ Expiration Date _____

Signature _____

Mail this application to : AAZK Administrative Offices, Topeka Zoo, 635 S.W. Gage Blvd., Topeka, KS 66606-2066 U.S.A. Make checks/money orders payable to AAZK, Inc. Must be in U.S. FUNDS ONLY.

Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

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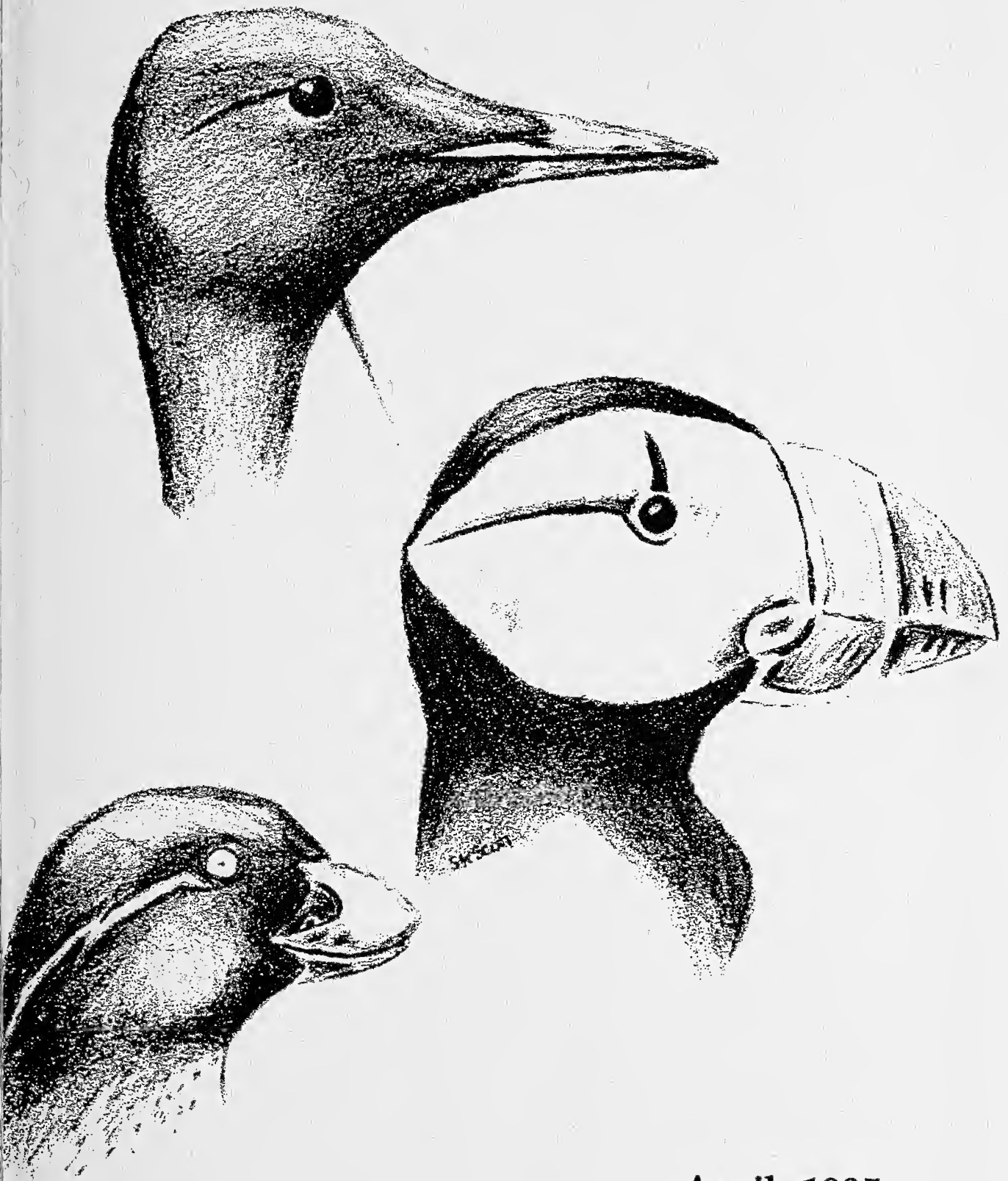
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Animal Keepers' Forum

The Professional Journal of AAZK, Inc.



April 1995

Dedicated to Professional Animal Care

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Barbara Manspeaker, Administrative Secretary

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April 1995
Volume Twenty-two
Number Four

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Rachél Watkins Rogers, San Diego Zoo

Ethics

Mark de Denus, Assiniboine Park Zoo

Research/Grants

Chair - Susan Barnard, Zoo Atlanta

Publications Funding

David Luce, Chaffee Zoological of Fresno

AAZK Chapter Logo Products

Jay Christie, San Marcos, TX

Enrichment Committee

Dianna Frisch, Columbus Zoo

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Zoo University List

Mike Illig, Metro Washington Park Zoo

Keeper Accommodations List

Todd Cleveland, Denver Zoo

International Outreach - Jeanette Beranger, Roger Williams Park Zoo (Chair)

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Lois Johannes, L. A. Zoo - Coordinator Foreign Member Sponsorship Program

Kathy Kelly, National Zoo - Project M.A.R.C. (Making A Realistic Contribution)

Jeanette Beranger, Roger Williams Park Zoo - Coordinator Technical Assistance

AAZK Training Materials

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Patty Pearthree, Indianapolis Zoo

Elephant Managers Association

Dinah Wilson, Marine World Africa USA

CAZPA Liaison

Oliver Claffey, Metro Toronto Zoo

AAZK PUBLICATIONS - CONTINUING DATA COLLECTION

Zoo Infant Development Project -

Teri Maas/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Kim Livingstone, L.A. Zoo (Passerines)

Jeanne Bocconcelli, Newark Museum Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Grand Rapids, MI

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Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and **double-spaced**. All illustrations, graphs, charts and tables should be clearly marked, in final form, and should fit in a page size **no greater than** 15cm x 25 1/2 cm (6" x 10"). Literature used should be cited in the text (Brown, 1986) and alphabetically in final bibliography. Avoid footnotes. Include scientific name of species (as per ISIS) the first time it is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs., etc.). Black and white photos **only** are accepted. Color slides should be converted to black and white glossy prints (minimum size 3" x 5") before submission. Clearly marked captions should accompany photos. Please list photo credit on back on photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

DEADLINE FOR EACH ISSUE IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association. Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$2.00 each.

*This month's cover features three species of sea birds -- the Thick-billed Murre (*Uria lomvia*), Horned Puffin (*Fratercula corniculata*), and Parakeet Auklet (*Cyclorhynchus psittacula*) drawn by keeper Susan Scott of the North Carolina Zoological Park in Asheboro, NC. These birds are exhibited in the new Alcid Habitat that opened at the zoo this month. The indoor habitat that recreates the rocky cliffs of an Alaskan coastline is up to 20 feet deep, 50 feet wide and 25 feet high. The birds explore along artificial rockwork above a 50,000-gallon refrigerated pool that provides an additional 12 feet of depth to swim, forage for food and provide spectacular underwater viewing for zoo visitors. Thanks, Susan!*

Scoops

and

Scuttlebutt

Center for Ecosystem Survival Awarded Conservation Grant

The David and Lucile Packard Foundation has awarded a \$55,987.00 grant to the Center for Ecosystem Survival and its Ecosystem Survival Plan (ESP) for the development of a new Marine Conservation Initiative. Funds will be used to develop the Marine Conservation Meter® as an educational and interactive exhibit to engage the public in supporting critical marine habitat protection. The program will provide an opportunity for aquaria and zoos to become involved in direct *in-situ* conservation.

The grant award also will provide funding for the development of companion marine/coral reef educational materials, brochures, and resource guide for schools and the public. The National Aquarium in Baltimore and the Monterey Bay Aquarium will unveil the first Marine Conservation Meters this spring. To receive further information regarding the Marine Conservation Meter contact: Norman Gershenz, Center for Ecosystem Survival, 1 Zoo Road, San Francisco, CA 94132 (415) 753-7052.

Donations from Chapters Continue to Assist AAZK Operations

The AAZK, Inc. Board of Directors and the staff of Administrative Offices would like to thank the following Chapters for their generous donations to the General Operating Fund of this Association: Portland Chapter AAZK, Portland, OR (\$25.00); Flint Hills Chapter AAZK, Manhattan, KS (\$25.00); Los Angeles Chapter AAZK, Los Angeles, CA (\$100.00); and Chinook Chapter AAZK, Calgary, Alberta, Canada (\$50.00). Our sincere appreciation to all the members of these Chapters for their financial support of their professional association.

IMPORTANT CHAPTER TAX NOTICE

If your Chapter has received a 1994 Return for Organizations Exempt From Income Tax booklet from the Internal Revenue Service, PLEASE DO NOT disregard this package. All Chapters who receive this package MUST return either Form 990 EZ or Form 990. If your Chapter's gross receipts are normally not more than \$25,000.00, you may fill out Form 990 EZ. If your Chapter received this packet and you need help with the instructions for completion, please do not hesitate to call AAZK Administrative Offices at 1-800-242-4519. The Tax Forms MUST be filed no later than **15 May 1995**.

* After you have completed the form which is appropriate for your Chapter, be sure and retain a copy for your Chapter records and forward a copy on to AAZK Administrative Offices for your permanent Chapter file which is kept at Topeka. Please let us know if you need help, but DO NOT disregard these forms--if your Chapter received one, it MUST be filed.

April is Election Month for New Board Members

This month all Professional members of AAZK, Inc. (in good standing) will be receiving ballots for the election of new members to the AAZK, Inc. Board of Directors. Three positions are up for elections this year. Completed ballots must be returned in the envelope provided by 1 **June 1995**. Ballots are sent directly to a Certified Public Accountant who tabulates the results for the Association. Members are reminded **not** to include anything other than their ballot in this envelope (publication orders, membership renewals, etc.) as it **does not** come to AO in Topeka.

Running for Board positions this year are: Diane Callaway, Omaha's Henry Doorly Zoo, Omaha, NE; Marilyn Cole, Metro Toronto Zoo, Ontario, Canada; Michael Illig, Metro Washington Park Zoo, Portland, OR; David Luce, Chaffee Zoological Gardens of Fresno, Fresno, CA; and Lucy Segerson, North Carolina Zoological Park, Asheboro, NC.

Please Note: Photo Credits

We apologize for photo credits not being properly given on two articles which appeared in the March 1995 issue of AKE. Photos for the article entitled "Raising Asha...the Hand-rearing of a Western Lowland Gorilla" were taken by Nancy Adams, Denver Zoo; photos accompanying the article "The Use of an Artificial Termite Mound for Chimpanzee Enrichment" were taken by Tom Woods of the North Carolina Zoo Design Staff. Again our apology for this oversight.

Change of Address Reminder for ALL Members

All members are asked to PLEASE send in all changes in their addresses promptly. It now costs the Association **50 cents** every time an AKE is returned to our office because of an address change we were not made aware of. This money could be put to better use by AAZK. Please be aware of several things: 1) While you may register a change of address at your local post office, if you do not notify AAZK directly, the first AKE sent from here after your move will eventually be returned to Topeka by the P.O. Because AKE is mailed under a nonprofit, bulk permit it is **not automatically forwarded** to your new address. The Post Office only guarantees the forwarding of First Class mail. 2) If you fail to notify AAZK directly of your address change and you miss receiving one or more issues of AKE, they will not be resent to you free of charge. Please help us save money and guarantee that you won't miss any issues of AKE. When you move, please send us your new address ASAP!

Conservation Trip to Madagascar Planned

In November-December 1994, a small group of keepers and biologists traveled to Madagascar to assess the feasibility of worldwide keeper involvement in conservation projects throughout Madagascar. The project team has completed the initial assessment and is currently organizing a project in conjunction with Parc Tsimbazaza to tentatively take place in September of 1995. Other projects are pending. If you would like more information, please contact Margit E. Holfinger, 2131 N. Main St., Racine, WI 53402. (414) 636-9189 (w); (414) 633-6919 (h); FAX (414) 636-9307.

Correction to Note

In last month's Scoops & Scuttlebutt under the item about the Aftermath of the Earthquake in Kobe, Japan, the two zoological facilities mentioned were incorrectly identified as the Kobe Zoo and Kobe Aquarium. The zoo in Kobe is called the Oji Zoo and the aquarium is Suma Aqualife Park. Thanks to Ken Kawata, Curator of the Belle Isle Zoo & Aquarium, Royal Oak, MI for bringing this to our attention.



Coming Events

The First Annual Meeting of the Nurtition Advisory Group of the AZA

May 1-2, 1995

Toronto, Canada

The meeting will be co-hosted by the Metro Toronto Zoo and the University of Guelph. For further information, contact: Eduardo Valdes, Metro Toronto Zoo, P.O. Box 280, West Hill, Ontario, Canada M1E 4R5 (416) 392-5982, FAX 416-392-4979; or Jim Atkinson, University of Guelph, Dept. of Animal and Poultry Science, Guelph, Ontario, Canada N1G 2W1 (519) 824-4120 ext. 3716, FAX 519-836-9873.

18th Meeting of the American Society of Primatologists

June 21-24, 1995

Scottsdale, AZ

Hosted jointly by the Primate Foundation of Arizona and Arizona State University, the meeting will be held at the Safari Resort in this Phoenix suburb. Scientific sessions convene on Thursday morning of 22 June and continue through Saturday afternoon of 24 June. Additional information is available from: Jo Fritz, Primate Foundation of Arizona, P. O. Box 20027, Mesa, AZ 85277-0027; voice: (602) 832-3780; FAX - (602) 830-7039; e-mail: 75031.3052@compuserve.com.

Zoos: Committing to Conservation

July 13-16, 1995

Columbus, OH

Hosted by the Columbus Zoo. For further information, contact Beth Armstrong, The Columbus Zoo, Box 400, 9990 Riverside Dr., Powell, OH 43065-0400; (614) 645-3426.

AAZV/WDA/AAWV 1995 Joint Conference

August 12-17, 1995

East Lansing, MI

Conference will be held jointly with the American Association of Zoo Veterinarians (AZV), the Wildlife Disease Association, and the American Association of Wildlife Veterinarians. Program will include paper sessions, workshops, student and graduate competition and poster session. For conference information contact Wilbur Amand, VMD Executive Director, 3400 W. Girard Ave., Philadelphia, PA 19104-1196; phone (215) 387-9094; FAX (215) 387-2165.

The International Society of Zooculturist Annual Conference

August 23-26, 1995

Idaho Falls, ID

To be held at the Tautphaus Park Zoo. For more information contact: Bill Gersonde, Superintendent, Tautphaus Park Zoo, Box 50220, Idaho Falls, ID 83405. (208) 528-5552.

The 16th Annual Elephant Managers Workshop

October 10-14, 1995

Tacoma, WA

Headquartered at the Tacoma Inn. For further information contact: Bruce Upchurch or Sally LaTorres, Point Defiance Zoo & Aquarium, 5400 N. Pearl St., Tacoma, WA 98407-3218, (206) 591-5337, ext. 154.

Remaining AZA 1995 Regional Conferences

AZA Southern Regional (April 9-11, 1995) - For further information, contact Harriet James, Jackson Zoo, 2918 West Capitol St., Jackson, MS 39209 (601) 352-2585.

AZA Western Regional (April 23-25, 1995) - For further information, contact Rich Hendron, Utah's Hogle Zoo, P.O. Box 58475, Salt Lake City, UT 84108 (801) 582-1632.

AZA Northeast Regional (May 7-9, 1995) - For further information, contact Glenda Nelson, Virginia Zoo, 3500 Granby St., Norfolk, VA 23504 (804) 624-9937.



Births & Hatchings



Omaha's Henry Doorly Zoo (Omaha, NE) ...announces the following B&H for 1994:

Mammals - 8.5 Black-footed ferrets (*Mustela nigripes*) [E/SSP]; 1.0 Senegal bushbaby (*Galago senegalensis moholi*); 1.2 Californian sea lion (*Zalophus californianus californianus*) [1.1 DNS]; 1.1 Reeves muntjac (*Muntiacus reevesi*); 0.0.2 Lesser tree shrew (*Tupaia minor*) [0.0.1 DNS]; 0.0.1 Brush-tailed porcupine (*Antherurus africanus*); 1.1.1 Geoffroy spider monkey (*Ateles geoffroyi*) [T]; 2.4 Dama gazelle (*Gazella dama*) [T]; 0.2.2 King Island wallaby (*Macropus rufogriseus*), 0.1 Reticulated giraffe (*Giraffa camelopardalis reticulata*); 5.2 Nile lechwe (*Kobus meagceros*); 1.1.2 Prevost's squirrel (*Callosciurus prevosti*) [1.0 DNS]; 2.1 Celebes macaque (*Macaca nigra*); 0.0.1 DeBrazza monkey (*Cercopithecus neglectus*); 0.0.1 Stuhlmann's monkey (*Cercopithecus mitis stuhlmanni*); 0.0.8 Vampire bat (*Desmodus rotundus*) [0.0.2 DNS]; 1.0 South America tapir (*Tapirus terrestris*) [E]; 0.0.1 Mandrill baboon (*Papio sphinx*) [T]; 1.2 African lion (*Panthera leo*); 0.0.1 Gray-legged douroucouli (*Aotus trivirgatus griseimembra*); 1.0 White-handed gibbon (*Hylobates lar*) [E]; 0.0.5 Egyptian fruit bat (*Rousettus aegyptiacus*) [0.0.1 DNS]; 0.1.1 Black howler monkey (*Alouatta caraya*) [E].

Birds - 0.0.3 Black-footed penguin (*Spheniscus demerus*) [0.0.1 DNS] [E]; 0.0.5 Goliath heron (*Ardea goliath*) [0.0.1 DNS]; 0.0.2 Black crake (*Limnocorax flavirostra*); 0.2.1 Emu (*Dromaius novaehollandiae*) [0.0.1 DNS]; 0.0.1 Red-vented bulbul (*Pycnonotus cafer*) [1st time for zoo]; 1.0 Black-necked swan (*Cygnus melanocoryphus*); 0.2.2 Mute swan (*Cygnus olor*) [0.0.2 DNS]; 0.0.2 Demoiselle crane (*Anthropoides virgo*) [hatched by artificial insemination]; 0.0.14 Greater rhea (*Rhea americana*); 0.0.15 Ringed teal (*Callonetta leucophrys*); 0.0.2 Golden pheasant (*Chrysolophus pictus*); 5.3 Pintail (*Anas acuta*); 0.0.4 Cinnamon teal (*Anas cyanoptera*) (0.0.1 DNS); 0.0.1 Sarus crane (*Grus antigone*) [T]; 0.0.24 Cattle egret (*Ardeola ibis*) [0.0.1 DNS]; 0.0.2 Common piping guan (*Aburria pipile*); 0.0.1 Hammerkop (*Scopus umbretta*); 0.0.7 Roseate sponbill (*Ajaia ajaia*) [0.0.1 DNS].

Reptiles/Amphibians - 1 Ball python (*Python regius*) [1st time for zoo]; 2 Home's hingeback tortoise (*Kinixys homeana*) [T]; [1st time for zoo]; 1 Green and black poison arrow frog (*Dendrobates auratus*) [T]; Fire-bellied toad (*Bombina orientalis*); Tomato frog (*Dyscophus infularis*) [1st time for zoo]; and White's tree frog (*Litoria caerulea*). submitted by Jay Tetzloff, Chapter Liaison, Omaha Chapter AAZK, Henry Doorly Zoo, Omaha, NE.

Folsom Children's Zoo (Lincoln, NE)...reports the following significant B&H for 1994:

Mammals - 3.0.7 Rodrigues fruit bat (*Pteropus rodricensis*) [E/SSP]; 1.0.1 Spectacled bear (*Tremarctos ornatus*) [E/SSP/1st for facility]; Bactrian camel (*Camelus bactrianus*) [1st successful birth for facility]; 0.0.2 Red panda (*Ailurus fulgens*) [DNS, E/SSP]; 2.0.3 Pygmy marmoset (*Callithrix pygmaea*) [T].

Birds - 0.2 Emu (*Dromaius novaehollandiae*) [1st for facility].

Reptiles - 0.0.4 Leopard tortoise (*Geochelone pardalis*) [T/1st for facility]; 0.0.7 Occelated sand skink (*Chalcides ocellantus*) [1st for facility].

Houston Zoological Gardens (Houston, TX)...the Bird Department proudly announces the first world captive breeding of the Omao (Hawaiian Thrush) on 31 January and 1 February 1995.



Message from the President

The following is a synopsis of the AAZK, Inc. Financial Statement for the period from 1 January, 1994 - 31 December, 1994. I have combined like items under one category for this overview. Percentages have been rounded off to the nearest whole number.

<u>REVENUES</u>	<u>Actual</u>	<u>Projected for 1994</u>
Membership	\$71,575.50	\$75,000.00
Chapter Fees	4,825.00	5,000.00
Donations	7,719.77	9,500.00
AAZK National Conference	2,700.00	4,000.00
Sales (accessories, publications, videotapes)	14,573.50	14,525.00
Advertising Sales - AKF	2,915.00	1,500.00
Interest Income, Chapter Products	1,799.37	1,500.00
Bowling for Rhinos	105,752.75	100,000.00
Conservation Endowment Contributions, MBNA Credit Card royalties for support of Research/Grants	2,943.90	1,350.00
Miscellaneous	979.07	300.00
Total Revenue	\$215,783.86	\$212,675.00

Membership accounted for 33% of revenues; Bowling for Rhinos 49%, and all other categories combined were 18% of revenues received in 1994.

<u>EXPENSES</u>	<u>Actual</u>	<u>Projected for 1994</u>
<i>Animal Keepers' Forum</i>	\$22,027.61	\$23,100.00
Other Publications	18,366.34	4,900.00
Office Expenses	25,104.13	23,950.00
Wages	37,384.89	37,000.00
Employer Taxes	2,989.73	
Committees	5,251.87	23,595.00
Conservation Contribution (Bowling for Rhinos & Adopt-a-Park)	95,000.00	100,000.00
Total Revenue	\$206,124.57	\$212,545.00

The *Animal Keepers' Forum* was 11% of expenses, Other publications 9%, Office expenses 12%, Wages and Taxes 19%, Committees 3%, and Conservation Donations were 46% of expenses for 1994.

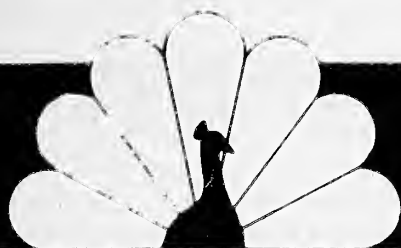
As you can see, membership dues are the main source of income for the Association. I strongly urge you to ask fellow keepers and associates to join us in our endeavors to continually upgrade our profession. Bowling for Rhinos accounts for almost half of our revenue and expense. The Bowling for Rhinos monies are being sent in installments per Andy Lodge's request. All money raised for this noteworthy project will be sent for rhino conservation in either Kenya (Ngare Sergoi) or Indonesia (Ujung Kulon).

Chapters will be receiving the complete 1994 financial statement. If you are not a member of a Chapter, and wish to receive a copy, please contact me with your request.

Janet McCoy

Janet McCoy, President AAZK, Inc.
Metro Washington Park Zoo
Portland, OR





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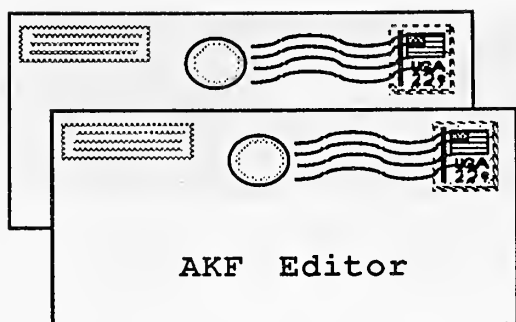
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Letters to the Editor

Dear Editor,

In response to Executive Director Ed Hansen's request for new ideas which would "develop avenues to improve the quality of membership", I suggest the development of an Animal Keeper Accreditation Program. Like the AZA Management Development School, it would involve one week a year for two years. Those people who successfully complete both sessions would receive a certificate of accreditation and patches for their uniforms which signifies their accomplishment.

Selecting a permanent site in a major zoo would provide the necessary resources to conduct a professional accreditation program. Many keepers would have trouble meeting the cost of such a program. In order to make it available to all keepers AAZK could provide grants, loans with interest and the keeper staff at the parent zoo could provide lodging free or at a nominal cost which would be applied to meeting the cost of the program.

The first year of the program would cover practical subjects like animal husbandry, sanitation, nutrition and report writing and so on. The program would involve classroom training and field work on site at the zoo. The second year would be more technical in nature with most of the students' time spent in class. This part of the program would cover behavior, research, enrichment, classification, interpreting an animals' natural history and applying it to exhibit design and enrichment.

Of course these subjects are merely a suggestion. If AAZK decides to develop an accreditation program, a great deal of research would be necessary to establish a meaningful curriculum.

An accreditation program may not be for everyone, but it offers those keepers wishing to develop their craft an avenue to do it in a program tailored specifically for their profession. Considering the quality of the members of AAZK, I believe there would be many who would take the course.

An accreditation program would raise money for AAZK and increase the level of professionalism of the organization. But, more importantly, it provides an important service to our most important resource—our members.

Jim Bousquet
Spokane, WA

Dear Animal Keepers' Forum,

Last year I wrote to the *Forum* requesting some general information on several subjects. One of my questions regarded enrichment for Hyenas and my letter was channeled to Dianna Frisch, Columbus Zoo. I was excited to receive a lot of great information on Hyenas as well as information on the newly formed AAZK Enrichment Committee—so much so that I was prompted to form an enrichment committee at The Zoological Society of San Diego, my place of employment.

I want to express my gratitude to Dianna. I would also like to tell you a little about our group. We have adopted the name The Enrichment Resource Committee. We feel that the name exemplifies the purpose of our group. TERC meets monthly. We have five individuals who make up the core group. That group refers to themselves as the Core Worker Enrichment Resource Committee (CWERC). The CWERC is responsible for making sure projects are accomplished in a timely manner and that information is distributed throughout the zoo. The CWERC meets whenever necessary.

The following is our Mission Statement: "The Enrichment Resource Committee consists of employees dedicated to promoting behavioral and environmental strategies for captive animals. We serve as a forum for sharing ideas, techniques and practical knowledge."

We have a great deal of support from our colleagues and staff. We are compiling notebooks with enrichment ideas for mammals, birds, and reptiles. We would love to exchange information with any interested parties. We would also like to hear how other Enrichment Committees got started and what they've accomplished.

Most sincerely,

Allison Bureau, Coordinator
The Enrichment Resource Committee
The Zoological Society of San Diego



AAZK AWARD NOMINATIONS ARE NOW BEING ACCEPTED FOR 1995

The AAZK, Inc. Awards Committee would like to begin accepting nominations for the **Lifetime Achievement Award (LA)** to be presented at the 1995 AAZK Conference in Denver. The deadline for all award nominations is **1 June 1995**. All award nominations received after 1 June will be reviewed for 1996, so please keep this in mind when submitting your nominations.

All awards given by the AAZK do not have a minimum or maximum number offered each year. Also, if the nominees do not meet the qualifications and nominators do not follow the nomination procedures, they will not receive the award for which they were nominated. Please include scientific names of animals when they are included in the nomination of a special or outstanding breeding acknowledgment.

Please submit all nominations to:

Anna Michel, AAZK Awards Chair 1995
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, OR 97221

LIFETIME ACHIEVEMENT (LA) Award

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Lifetime Achievement Award presented by the AAZK Awards Committee. This award is to be given at the end (retirement) of a keeper's career. The purpose of the award is to recognize outstanding commitment to professionalism as a zoo keeper over a long period of time, and significant contributions to the community.

The character of the award includes; a plaque, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes: Volume 1; United States and Canada. The latter is published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The Lifetime Achievement Award was established by the 1993 Awards Committee, Janet McCoy, Chair. Rachel Rogers proposed the award to the AAZK Board of Directors. The award is presented at the annual AAZK National Conference.

Qualifications:

1. The nominee **must** be a full-time keeper retiring from a career of zoo keeping and employed in any North American zoological institution, aquarium or related facility.
2. The nominee must have been employed at least twenty years on permanent status at a zoo, aquarium or related facility.
3. The nominee **must** be nominated by **two** of his or her peers who have also been employed at that same zoo, aquarium or related facility. Supporting nominations may be submitted by management personnel from the same institution.

Nomination Procedure:

1. List name, position, institution's name, address, phone and Director, years of service in the field and the recommendation of peers or colleagues.
2. List and **document** outstanding achievements: exhibits, breeding, education, project participation, papers, etc. **Verification** of these facts must be signed by the zoo director, curator, or immediate supervisor of the individual being nominated.

AAZK Lifetime Achieve Award Criteria, Continued

3. Describe extra activities outside of zoo, aquarium or related facility work: working with conservation groups, animal related youth groups, rehabilitation wildlife officials, etc.
4. Paragraph of why the nominee fits the criteria.
5. Provide 3 - 5 references.
6. Deadline for nominations is **JUNE 1st** of each year.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.



A Brief Message from the NEC

In the past, the offices of President and Vice-President of AAZK, Inc. have been selected by and from the elected members of the Board of Directors. This method left little input from those outside of the Board about who will hold the officer positions of the Association. In an effort to make these choices in a more democratic fashion, a new policy has been drafted by the Board.

An Executive Committee will be chosen from the following individuals: Board of Directors (7); Two Immediate Past Presidents (2); Nominations and Elections Committee Members (3); CHAIRS of the Conservation, Preservation and Restoration (CPR), Bylaws, Research/Grants, Awards, Historian, L.I.N.K., Animal Data Transfer Form (ADT), Keeper Accommodations List (KAL), International Outreach Committee, Exhibit Design, and Staff Exchange (11) - for a total of no more than 17 individuals. If an individual were involved with more than one position, they would only cast one vote. A large pool was chosen in the event that some could not serve.

The selection process will begin on 1 July 1995 and end on 1 September 1995. The reason this calendar period is late in the year is because the only persons eligible would be elected Board members with a minimum of a two-year term left to serve on the Board. Current eligible Board members are: Jan McCoy, Ric Urban and Alan Baker. The others would be the four newly elected Board members from this year's BOD election. Should they all choose to run, a total of seven persons would be eligible to run for President and Vice-President. Those choosing to run would be responsible for submission of a resumé and platform statement to the NEC Chair for consideration. Further information will be available to the membership, so keep your eyes open!

Zoo Studies Program Offered

Friends University, in association with the Sedgwick County Zoo, Wichita, KS, is offering undergraduate and graduate training in zoo studies. The Bachelor's of Science is a unique, fully-accredited, 4-year program which combines course work and practical work experience at the zoo. The Masters of Science in Environmental Studies is a fully-accredited, 21-month program, with a possibility of a zoo studies emphasis for those with prior zoo experience. For further information, contact Alan Maccarone, Biology Department, Friends University, 2100 University, Wichita, KS 67213 (316) 261-5890.

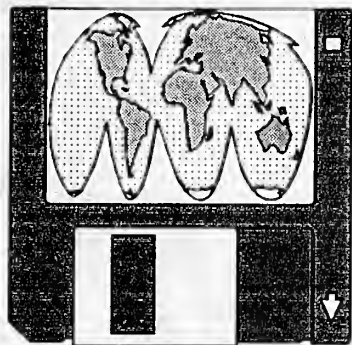
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"The GreenDisk is a great tool for keeping up-to-date on environmental issues and position statements from various groups. Thanks for all your effort, innovation and commitment."

- Susan Chan, Editor, *Animal Keeper's Forum*.

"No environmentalist or library should be without it."

- William Ellis, Editor, *TRANET*.



The GreenDisk Paperless Environmental Journal is an innovative concept in environmental information exchange. Educators and researchers all over the world find it a powerful and inexpensive resource for conservation research and activism. Each semi-monthly issue is a computer disk in IBM or Macintosh format and contains the equivalent of hundreds of pages of well-organized and timely information in a keyword searchable format using a minimum of natural resources. The GreenDisk covers a wide range of challenging environmental issues such as renewable energy, wildlife conservation, pesticides, ecosystem restoration, rainforest destruction and ozone layer depletion. Regular features found in each edition of the journal include action alerts; press releases; index of periodicals; listing of recent publications; the *Environmental Computing Digest*; a calendar of meetings and events; employment opportunities; university program listings; environmental education resources and more. Searching this database connects you with the article, publication, organization, meeting, video or other resource directly related to the topic you are researching. Here are some examples of 'hits' found from searching for select topics: Arctic National Wildlife Refuge - 12; CITES - 66; Clean Water Act - 59; coral reef - 64; driftnet - 40; elephant and poaching - 9; ethnobiology - 11; Everglades - 31; tiger and conservation - 35; Tongass - 28; Tropical Forestry Action Plan or TFAP - 9; turtle excluder device - 4; whales or whaling and Norway - 51; wolf or wolves and Alaska - 39. Each issue is a compendium of information on a particular topic. Past issues (which may be ordered separately) have focused on:

Vol.1#1 - Hazardous Waste Incineration.
Vol.1#2 - Jobs in a Sustainable Economy.
Vol.1#3 - Biodiversity.
Vol.1#4 - Environmental Computing I.
Vol.1#5 - Wilderness Recovery Strategy.
Vol.1#6 - Transnational Corporations.
Vol.2#1 - Pesticides.
Vol.2#2 - Trade and the Environment.

Vol.2#3 - Chlorine: Persistent Poison.
Vol.2#4 - Environmental Computing II.
Vol.2#5 - Toxic Technologies Transfer.
Vol.2#6 - The World Bank and IMF.
Vol.3#1 - Population and Consumption.
Vol.3#2 - Decline of Global Fisheries.
Vol.3#3 - Anti-Environmental Backlash.
Vol.3#4 - Environmental Computing 1995.

A SPECIAL OFFER! Subscribers may order back issues for \$5 each, nonsubscribers \$10 each. Ordering the entire library of back issues will allow you to query your own massive database of environmental information. Subscribe for one year and you will receive all 16 issues (over 5000 pages) to load onto your computer's hard drive for only \$50 -- that's six issues free! Your satisfaction is assured -- if you are not thoroughly impressed with the database, you will receive a complete refund and keep all of the back issues as our thanks for reviewing them.

Name & Title: _____
Address: _____
City, State: _____ Postal Code, Country: _____
Internet Email Address: _____
What type of computer do you have? ☐ Macintosh ☐ IBM-PC. Disk size? ☐ 3.5" ☐ 5.25"

A one year (6 issue) subscription is \$45. Payment is by check or money order only (no purchase orders). Foreign subscriptions are \$US50 per year payable in American Express Traveler's checks or a check drawn on a US bank. Send check or money order along with this completed order form to: The GreenDisk, PO Box 32224, Washington, DC 20007. Phone: 1-800-484-7616 (Code #3475). EcoNet <greendisk> Internet <greendisk@igc.apc.org>. 100% money-back guarantee on all orders.



DOWN UNDER

By
Judie Steenberg, Keeper
Woodland Park Zoo
Seattle, WA

DOWN UNDER.....is an information column about Australasian animals. While there are a number of Keepers who work in Australasian Units, or routines, off times a Keeper will have a few species

of animals from the Australasian zoogeographical region on their string or routine. It is hoped this section will contain information on birds, mammals and reptiles.

This column is intended to:

- share experiences and information to improve the care and management of Australasian animals.
- seek information and advice on problems that occur.
- serve as a forum through which to make comment, to ask questions, to critique, or to verify information.

Please send your materials (a question, a paragraph or an article) directly to Animal Keepers' Forum, Topeka Zoological Park, 635 Gage Blvd., Topeka, KS 66606, Attn: Susan Chan.

Keeper to Keeper...here's a chance to "make a difference", either as an individual, or as a group, to help a species. Please consider having a bake sale, silent auction, book sale or maybe a white elephant sale to help raise funds to combat avian TB in marsupials, especially Tree Kangaroos.....read on!

Tree Kangaroo SSP Seeks Funds for Avian TB Research

Mycobacterium avium, otherwise known as avian tuberculosis (TB), is having a serious effect on the management of tree kangaroos in captivity. The potential for this disease to negate the accomplishment of the Tree Kangaroo SSP Master Plan is exemplified by the deaths of several genetically important tree kangaroos, due to Avian TB.

Funds are being sought to develop diagnostic tests and a vaccine to protect tree kangaroos from Avian TB. Laboratory space in which to conduct the research is available at the National Zoo, and the Smithsonian Institution has purchased a \$36,000.00 Elisa Reader - an essential piece of equipment for this project. To date, \$9,225.00 of the \$35,000.00 needed to fund the first year of the vaccine research has been committed.

Avian TB has been reported in three species of tree kangaroos in the North American Region. This disease is difficult to detect and to diagnose. Traditional skin testing is unreliable, and specific testing and cultures are necessary to diagnose avian TB, which can be associated with osteomyelitis, pneumonia, subcutaneous abscesses and joint involvement.

It has been determined by the TK-SSP Veterinary Advisory Group that the best course of action to mitigate the consequences of this disease is to develop a vaccine. Preliminary

DOWN UNDER, *Continued*

work on the development of improved diagnostic tests and a method for evaluating the marsupial immune system has been promising and warrants further study.

The TK-SSP is currently seeking funds to retain the services of Dr. Ruth Cromie, who had modified a vaccine (*M. vaccae*) for use in waterfowl, at the Waterfowl Trust, Slimbridge, England. Dr. Cromie could be available in June 1995 to continue preliminary work on adapting the vaccine for marsupials.

*A contribution in any amount will help. Thank you
for your consideration of this request.*

Please send donations to the attention of Judie Steenberg, Action Plan Facilitator, Tree Kangaroo SSP, Woodland Park Zoological Gardens, 5500 Phinney Ave. North, Seattle, WA 98103. (Please make checks out to TK-SSP Avian TB Research Fund).

or, for additional information please contact J. Steenberg (206) 684-4809 or 4011:
FAX# (206) 684-4854.



Request for Ideas: Cushioned Kitty Surfaces

Carnivore Keeper seeking alternative ideas for soft resting surfaces primarily for use in large cat holding areas. Cost, keeper time and sanitation are some considerations. Replies can be sent to: Craig Lewis, Sr. Keeper/Felines, Metro Washington Park Zoo, 4001 SW Canyon Rd., Portland, OR 97221; Phone (503) 226-1561 ext. 277 - FAX 503-226-0074

AAZK Book Sale

April 1995 List

Sug. Price \$Sale\$

- \$19.95 \$16.00 The U.S. Outdoor Atlas and Recreation Guide - John Oliver Jones. This unique guide contains maps and charts of all 50 states, detailed directions, addresses, and phone #'s to over 5,000 public and private facilities, as well as, national and state parks. 208 pgs. paperback**
- \$24.95 \$20.00 Meant to be Wild - The Struggle to Save Endangered Species through Captive Breeding - Jan DeBlieu. North American animals that are kept captive for their own protection and the struggle to restore them to their rightful places in the world. 384 pgs. hardcover. *Also available in paperback: sale price \$10.40 (sug. price \$12.95)**
- \$24.95 \$20.00 Animal Minds - Donald R. Griffin. If we can learn more about how the "other" animals think, behave, and plan it will be through the help of this book. 310 pgs. hardcover. *Also available in paperback: sale price \$10.40 (sug. price \$12.95)**

EARTH SOUNDS - Peter Roberts Productions. Nature's chorus recorded, preserving the sounds that have relaxed and entertained for all time.

Sug. price

Sale price

CD: \$15.95
Cassette: \$9.95

CD: \$12.80
Cassette: \$8.00

Earth Morning Song - CD or cassette
Rolling Thunder - CD or cassette
Mountain - available on cassette only

Previous books offered still available, some with price increases. Call (203) 576-8126 and ask for Jeanne Yuckienuz to get price update. **To order:** List the books, CDs or cassettes you want along with your name and complete mailing address. Include shipping fee of \$2 for the first book and \$1.00 for each additional book. Make checks or money orders payable to: AAZK Book Sale (U.S. Funds Only - no cash or CODs please). Mail order to: AAZK Beardsley Zoo Chapter, attn: Jeanne Yuckienuz, 1875 Noble Ave., Bridgeport, CT 06610-1600.



Patch Collectors, Look at This!

Bullfinch has a free collector's patch with its catalog of over 100 bird patches with source and price. You get our 3x4" Snowy Owl patch (great bird sitting on the ice in Duluth MN with the famous lift bridge in the background), the catalog **and** a collector's newsletter **all for only \$5.95**. Bullfinch issues new patches several times a year. The newsletter keeps you up-to-date on other patch sources. If you collect, if you think this might be fun, Bullfinch is the bird to watch. We also buy patches with images of birds, animals, and herps. Send check today: **Bullfinch, 3326 Martha Lane, Minnetonka MN 55345.**

Bullfinch buys patches. Write and tell us what you have.

Bowling for Rhinos UPDATE

from Patty Pearthree, BFR Coordinator
Indianapolis Zoo, Indianapolis, IN



One hundred thousand dollars (\$100,000) was sent to Ngare Sergoi Rhino Sanctuary (now called "Lewa Wildlife Conservancy" or L.W.C.) in Kenya and \$6,475.00 was sent to Ujung Kulon National Park in Java, Indonesia from the 1994 Bowling for Rhinos fundraiser. Everyone should be very proud that their hard work and great efforts allowed us to have another very successful year! We still need everyone's continued support of this effort in order to continue to expand our funding to possibly include Sumatran rhinos in the near future! Fundraising efforts in 1995 will continue to send the first \$100,000 to Ngare Sergoi (L.W.C.) and the rest to Ujung Kulon.

Funding for Ngare Sergoi (L.W.C.) will continue to support conservation education, purchase replacement vehicles, translocation of additional rhinos into the sanctuary, increased security patrols and equipment. funding for Ujung Kulon will be used to build a new guard post at the western tip of Java and a new security patrol boat (the best mode of transportation around the park).

I will be completing an internship this summer from **May 15-August 10 in Kenya**. All **BFR needs or questions should be addressed to Herbie Pearthree at the same address and phone as before**. As of the writing of this update on 12 March, I have not heard from the following Chapters or institutions as to whether or not they will hold an event this year. Please respond to me ASAP as to your proposed event date and any sponsor sheets or information you may need so that I can address these needs prior to May. If you will not be able to hold an event this year, please also respond with that information.

Assiniboine
Birmingham
Chaffee
Denver
Detroit
Franklin Park(Metro Boston)
Hogle Zoo
Honolulu
Jackson
Lake Superior
Lincoln Park
Little Rock
Mesker Park
Memphis

Metro Toronto
Miami Metro (South Florida)
Pittsburgh
Potawatomi
Queen's Wildlife Center
Robert Russo's Jungle Club
San Antonio
Sedgwick County
Topeka Zoo
Virginia
Walk in the Wild
Werribee
Western New York

- Remember, to be a trip winner, all money must be received by me no later than **1 September 1995**.
- Please be sure to write "For Deposit Only" on the back side signature area of any checks sent to me through the mail! This will prevent anyone besides AAZK from being able to cash the check.
- For additional information on BFR needs, please call Patty Pearthree at (317) 322-8723 or write to me c/o Bowling for Rhinos, P.O. Box 199026, Indianapolis, IN 46219-9026.
- **Between 15 May - 10 August**, please contact Herbie Pearthree at the above address and phone number.

Good luck with all your events in 1995!



AAZK Announces New Professional/Contributing Members

Chris Kieber, Buffalo Zool. Gardens (NY)	Teri Danehy, National Aviary in Pittsburgh (PA)
Julie Ann Eisert, Claws 'N' Paws WAP (PA)	Ellen Bartuska, Maymont Foundation (VA)
Louise Hill, Virginia Zool. Park (VA)	Harry E. Bellin, Discovery Island (FL)
Anthony Chaser, Tallahassee Mus. of His. & Nat. Sci. (FL)	
Kenn Harwood, Tallahassee Mus. of His. & Nat. Sci. (FL)	
Christine Coy, Miami Metro Zoo (FL)	Robert Callahan, Jr., Lion Country Safari (FL)
Diane Lutz, Dreher Park Zoo (FL)	Ruth Barroso, Busch Gardens (FL)
Peter Hoke, Lowry Park Zoo (FL)	Chrissy Haendiges, Columbus Zoo (OH)
Gretchen Bickert, Columbus Zoo (OH)	Paul A. Perdicas, Akron Zoo (OH)
Lyle Wedel, Sunset Zool. Park (KS)	Christine Branigan, Folsom Children's Zoo (NE)
Neil Carter, Oklahoma City Zoo (OK)	Shawna Mullins, Cheyenne Mtn. Zoo (CO)
Brian Zebell, Cheyenne Mtn. Zoo (CO)	Richard T. Caldwell, Cheyenne Mtn. Zoo (CO)
Shelly Lawson, Cheyenne Mtn. Zoo (CO)	Carol D. Gillespie, Cheyenne Mtn. Zoo (CO)
Shaye M. Erickson, Out of Africa Wildlife Park (AZ)	
Phyllis Webster, Sahuaro Vista Veterinary Clinic (AZ)	
Barbara Grisham, Santa Barbara Zoo (CA)	Mark Biancaniello, Neverland Valley Zoo (CA)
Chris Morehouse, Wildlife Safari (OR)	Christopher Dulong, Metro Toronto Zoo (Canada)
Dwight P. Knapik, Calgary Zoo (Canada)	

Renewing Contributing Members

Jay R. Christie, Curator, Cohanzick Zoo, Bridgeton, NJ
Central Park Zoo, New York, NY
Richard Buthe, Philadelphia Zoo, Philadelphia, PA
June L. Masek, Docent, Cleveland Metroparks Zoo, Cleveland, OH
Dr. William C. Sadler, Purina Mills, Inc., St. Louis, MO
Lynn Peckham, Docent, Los Angeles Zoo, Los Angeles, CA



ALL PURPOSE BELT POUCH

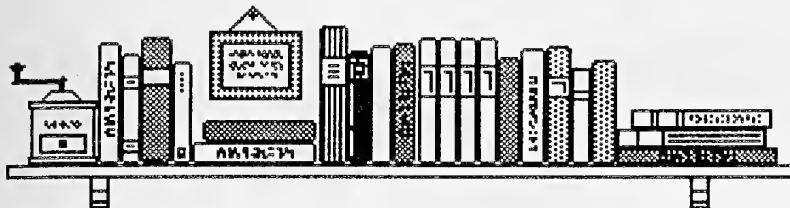
Heavy Cordura Fabric - Velcro Closure



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BOOK REVIEWS

Reptile Clinician's Handbook

By Fredric Frye, BSc, DVM, Msc, Cbiol, FiBiol,
Fellow, Royal Society of Medicine
Krieger Publishing Company, Malabar, FL, 1994

*Review by Sandra C. Wilson, DVM
Resident Zoological Medicine
Kansas State University
Manhattan, Kansas*

This book is subtitled "A Compact Clinical and Surgical Reference." It is the most recent book published by this well-known author of medical references on reptiles. Although it is written primarily for veterinarians, it contains a wealth of information which herpetologists, technicians, and zoo personnel will find most useful. Included are chapters on nutrition, laboratory procedures, clinical methods, surgery and nonsurgical procedures. Much of the information contained in this book has been abstracted from the author's previous publication, a large, two-volume text entitled *Biomedical and Surgical Aspects of Captive Reptile Husbandry*. However, the compact size and spiral binding make this handbook particularly useful in the veterinary clinic, laboratory, and any other work place.

The real value in this book is found in the many tables and lists found throughout the text and in the appendices. The reader can quickly find information on nutrient levels for a long list of commonly used fruits and vegetables, as well as information on food preferences and toxic plants. Also, dosages for a variety of anesthetics, antibiotics, and parasiticides are provided for use in veterinary procedures and treatment. The appendices include common/scientific name cross-referenced lists for more than 500 species of reptiles.

Chapters on laboratory procedures and clinical methods provide details on sample collection and processing, restraint and physical examination, and fluid therapy. Several tables provide hematology and chemistry values for a variety of species, and reference sources are listed at the end of each table. A great deal of useful information is packed into this pocket-sized handbook, and detailed Table of Contents and Index sections add to its value as a reference manual.

The Ultimate Noah's Ark

By Mike Wilks
Henry Holt and Company, Inc. 1993
New York, New York
Hardback \$24.95

*Review by Nell Ball
Mammal House Guide
National Zoo, Washington, DC*

If a book can have multiple personalities, this one does. It is a game, a puzzle, a purveyor of animal facts, art, a bit of history and some pure fantasy combined.

Mike Wilks has created a book with something for everyone. If you like animals, there is good factual information on some 700-plus species including insects, birds, fish, reptiles, amphibians and mammals. Puzzle fans can test their skill by trying to solve the mystery created by the author in his original painting which is the basis for the book.

Within this painting are pictures of all the 107 animals whose species are described elsewhere in the book. With one exception, the male and female are found somewhere in the picture. Which is the unmatched animal? This is the problem presented to the puzzle lovers. Some pairs are obvious, such as the Rhodesian ridgebacks seated side by side or the several species of birds perched with their mates on the same roost. Most are neither obvious nor easy.

Because of the various levels contained in The Ultimate Noah's Ark, it should appeal to a wide audience. Everyone loves a mystery and this one can be enjoyed by all ages. It isn't easy. Don't expect to whip through in one sitting and identify the species represented only once. It won't happen. But you will surely enjoy the search.



1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995



CONFERENCE SCHEDULE

FRIDAY, SEPTEMBER 22
Pre-Conference Trip A

SATURDAY, SEPTEMBER 23
Pre-Conference Trip B
Registration table open all afternoon
Exhibit hall open all afternoon

SUNDAY, SEPTEMBER 24
Registration table open
Exhibit hall open
Open Board meetings in AM
Committee meetings in PM
Evening Event: Icebreaker at Denver Museum of Natural History

MONDAY, SEPTEMBER 25
Registration table open
Exhibit hall open
Conference Welcome
Paper sessions AM & PM
Evening Event: Optional Central City Casino Trip. Workshops will be offered for those who do not wish to go.

TUESDAY, SEPTEMBER 26
Registration table open
Day at the Denver Zoo: includes behind-the-scenes tours, workshops, lunch, Zoolympics and dinner.

WEDNESDAY, SEPTEMBER 27
Registration table open
Exhibit hall open
Paper session AM
Awards Luncheon
Small groups meet PM
Tour of Rocky Mountain Arsenal Wildlife Refuge
Dinner on your own
Evening Event: Silent Auction

THURSDAY, SEPTEMBER 28
Registration table open
Exhibit hall open
Paper sessions AM
Lunch on your own
Workshops/small groups meet PM
Tour of Rocky Mountain Arsenal Wildlife Refuge
Evening Event: Final Banquet, live auction, dancing to a live band

FRIDAY, SEPTEMBER 29 THROUGH MONDAY, OCTOBER 2
Post-Conference Trip to Rocky Mountain National Park and Estes Park village.

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

CONFERENCE REGISTRATION FORM

Name _____

Address _____

City _____ State/Province _____

Zip/Postal Code _____ Phone (____) _____

Zoo Affiliation _____ Position/Title _____

AAZK Chapter _____ AAZK Membership Status _____

Number of AAZK Conferences you have attended _____

AAZK Committee Member? _____

Presenting a Paper/Poster? (please circle) Yes _____ No _____

Title _____

Participating in Zoolympics? Yes _____ No _____

Bringing an Auction Item? Yes _____ No _____

Optional Activities: (extra charges involved)

Need table in Exhibitors Hall? Yes _____ No _____

Casino Trip on Monday night Yes _____ No _____

Pre-Conference Trip A Yes _____ No _____

Pre-Conference Trip B Yes _____ No _____

Post-Conference Trip Yes _____ No _____

Horseback riding on Post-Conf. Trip Yes _____ No _____

Vegetarian? Yes _____ No _____ What type? _____

T-Shirt? Yes _____ No _____ Size (L, XL) _____

Arrival Date and Time _____

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

CONFERENCE FEE SCHEDULE

AAZK Member	\$100.00*	_____
Member Spouse	\$100.00*	_____
Non-Member	\$110.00*	_____
Non-Member Spouse	\$110.00*	_____
Casino Trip Charge	\$ 10.00	_____
Exhibitors Table Fee # Tables _____ (\$30.00 full table, \$15.00 half table)		_____
Daily Fee (which day) _____ (See Day Rates Schedule on next page)		_____
Pre-Conference Trip A	\$ 20.00	_____
Pre-Conference Trip B	\$ 35.00	_____
Post-Conference Trip	\$150.00	_____
Horseback Riding on Post-Conf. Trip	\$ 30.00	_____
Late Fee (after August 1, 1995) (only for full conference, not for individual days; no reservations for Pre- or Post-Conference trips accepted after August 1.)	\$ 10.00	_____
TOTAL FEE ENCLOSED	\$	_____

*Fee includes a \$20.00 contribution to AAZK National.

*Fee does not include cost of Conference Proceedings.

Please make checks payable (in U.S. funds) to: "AAZK Conference 1995"

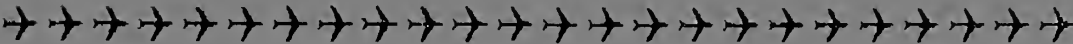
Send Registration form and all fees to:

Vickie Kunter
Rocky Mt. AAZK
Denver Zoo
2900 E. 23rd Ave.
Denver, Colorado 80205

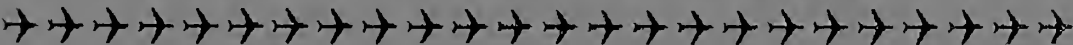
**1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995**

For those individuals who will not be attending the entire conference, the following rates show the cost of daily registration or single events. These rates apply ONLY to those individuals who do not pay the full registration fee. If you have registered and paid for the full conference, all events listed below are included in that fee. (Excepted is the optional Casino trip, which is an extra charge for full conference attendees.)

Sunday, September 24 Cost: \$26.00	Open Board meeting Committee meetings Evening Event: Icebreaker at the Denver Museum of Natural History
Monday, September 25 Cost: \$21.00	Paper sessions Workshops AM Break and Lunch
Cost: \$10.00	Evening Event (optional): Casino Night in Central City. Includes buffet dinner, 2 drinks, \$2.00 coupon for use in casino gift shop, ice cream cone and two Royal dollars at the Blackjack Table Match Play.
Tuesday, September 26 Cost: \$21.50	Day at the Denver Zoo. Includes behind-the-scenes tours, workshops, lunch, Zoolympics and dinner.
Wednesday, September 27 Cost: \$30.00	Paper sessions Workshops AM Break and Awards Luncheon Tour of Rocky Mountain Arsenal Wildlife Refuge Evening Event: Silent Auction
Thursday, September 28 Cost: \$38.50	Paper sessions Workshops AM Break Tour of Rocky Mountain Arsenal Wildlife Refuge Evening Event: Final Banquet



United Airlines has been chosen as the Official Carrier for the 1995 AAZK National Conference. For further information on fares in the U.S. and Canada, call 1-800-521-4041. Use reference #590XM.



1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

HOTEL REGISTRATION FORM

Name _____

Address _____

City/State/Zip _____

Telephone _____

Rooms will be held after 6PM only if guaranteed with a major credit card. Once guaranteed, there will be no refund for cancellation.

Credit Cards accepted: VISA, MasterCard, American Express, Diner's Club

Name as it appears on card _____

Card Number _____ Expiration Date _____

ROOM RATES:

_____ 1 Double Bed \$88.00

_____ 2 Double Beds \$96.00

****Cots may be set up in rooms for an additional charge of \$10.00**

****Up to four (4) people may stay in one room**

Arrival Date and Time _____

Departure Date and Time _____

Hotel Check-in: 2:00 PM

Check-out: 12:00 noon

****Roommates are the responsibility of each registrant****

Parking is available at the hotel for a fee of \$7.00 per day.

To make reservations by phone, dial 1-800-525-6651

Please return this form to:

**Executive Tower Inn
1405 Curtis Street
Denver, CO 80202**

**Reservations MUST be made by 1 September 1995
in order to receive special Conference rates**

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

PRE- AND POST-CONFERENCE TRIPS

Pre-Conference Trip A: Friday, September 22

Visit Colorado Springs with a stop at the Garden of the Gods--hiking trails surrounded by unusual red sandstone rock formations. Next stop is Cheyenne Mountain Zoo, whose base elevation is 6,800 feet! Lunch will be followed by behind-the-scenes tours. We will return to the Executive Inn Hotel in Denver for dinner on your own. **Cost: \$20.00 per person**

Pre-Conference Trip B: Saturday, September 23

Join us for a morning ride on the Cog Railway up 14,110 feet to Pikes Peak Summit. Then return for lunch on your own in historic Manitou Springs, filled with charming shops and a variety of restaurants. Early afternoon we will travel to the Pueblo Zoo for behind-the-scenes tours. The staff of this interesting 25-acre zoo then invites us to join them for dinner at their zoo. We will return to the Executive Inn Hotel in Denver after dinner.

Cost: \$35.00 per person

Post-Conference Trip: Friday September 29 through Monday, October 2

Come stay with us at Big Thompson Timberline Lodge located near Rocky Mountain National Park and Estes Park village. We have reserved large 3-bedroom cabins that are fully furnished for all your needs. Activities planned include hiking tours of Rocky Mt. National Park; a scenic drive along Trail Ridge Road which is the world's highest continuous paved highway at 12,000 feet; a tour of the Stanley Hotel where "The Shining" was filmed; plus lots of relaxation and hot tubbing! An optional horseback riding tour, lasting at least two hours, through the secluded trails of the Rocky Mt. Nat'l Park is also available at an additional cost. Please note: We will be returning to the Denver area by approximately 2:00 p.m. on Monday, October 2.

Cost is \$150.00 per person

**Additional horseback tour
is \$30.00**



Reservations for all Pre- and Post-Conference trips must be received by 1 August 1995. Due to the need to finalize our arrangements, we cannot accept any reservations after this date.

For more information about either the Pre- or Post-Conference trips please contact:

Linelle Lone (303) 331-5843 or (303) 320-1106

Managing Herps in an Aquarist's World

By
Rico Walder, Herpetologist
Tennessee Aquarium, Chattanooga, TN

Introduction

Reptile and amphibian management in large multi-taxa, habitat-based exhibits presents a unique set of challenges to the keeper. While frequently difficult, these challenges may represent the future trend of modern exhibitry. Many things must be considered when reptiles and amphibians are included in an exhibit's species list. Reptiles have very specific environmental requirements that should be addressed **before** an exhibit is considered. But, some things may have been overlooked or need to be modified after construction or renovation is completed. Competition and compatibility between species is a primary concern. Sometimes getting the right food to the right animal seems difficult if not impossible. This is just one of the many challenges facing today's professional zoo and aquarium keeper.

Environmental Concerns

Security and temperature are two of the most important concerns for reptiles. Reptiles and amphibians are typically shy, cautious creatures that fall prey to many higher vertebrates in the wild. A certain amount of cover is required to reduce stress and allow them to adapt to their exhibit. Using information gained from researching the needs of a given species, the keeper can provide the amount and type of cover needed to maximize the exhibit potential for his/her charges. One advantage to the keeper is that all reptiles must bask in order to maintain optimal body temperature. While each species has its own specific thermal requirements, a good starting point is to provide 90-95° F (32-35° C) at the basking site; an 80-85° F (27-30° C) ambient daytime high and 70-75° F (21-23° C) for a nighttime low. Behavioral observations play an important role in determining the exact thermal range that is best suited for the animal you are working with. If an animal is spending most of its time basking and little time feeding, it is a good indication that it is not reaching its optimal body temperature.

Accurate monitoring and documentation of the environment in which reptiles and amphibians are maintained is essential. We have used a variety of equipment to monitor thermal gradients within exhibits. Digital indoor/outdoor thermometers are used in several exhibits to monitor basking sites. A series of sensors can be installed to monitor micro-environments across the enclosure. These thermometers have several advantages; the digital technology is very accurate, and most have a 6-10-foot long waterproof sensing probe that can be easily hidden while allowing the keeper to read the temperature without disturbing the animal. Another tool used is a RAYNGER PM temperature gun. The user simply aims the unit at the surface to be monitored, depresses the trigger, and it immediately reads the surface temperature of the desired object. These tools are extremely useful where a minimum of disturbance is required or if an animal frequently disrupts its habitat, exposing hidden equipment. Several models with various features are available.

Neither you nor other non-reptilian exhibit inhabitants need to be exposed to the extreme temperatures that the reptilian inhabitants require. Heat can be provided in many ways! High wattage spot light bulbs can be focused on a beautiful prop or nicely dressed portion of substrate to create a locally hot basking site. Infrared heaters are very useful if a large surface area needs to be heated or additional lighting is not suitable for an exhibit. Other products such as heating pads and tapes are also available which can be buried in the soil or embedded in rockwork or artificial logs. Each of these heat sources have been used successfully at the Tennessee Aquarium, and each can provide adequate basking temperature for reptiles without affecting the rest of the exhibit inhabitants. The main objective is to provide the reptile with a zone of intense heat that will allow it to thermoregulate in as natural a manner as possible. If this can be done in an area that is easily viewed by the public, the educational component will be much greater.

Compatibility

In most ecosystems it is generally considered that big eats little. So how do you keep your exhibits from becoming another segment in the "Trials of Life"? Lots of planning and a little trial and error will go a long way in developing exhibits. Under most circumstances nearly all reptiles, with the exception of crocodiles and snakes, are compatible with other classes of animals. For example, many turtle and lizard species can be maintained with a variety of bird species, herbivorous mammals, fishes and a wide variety of invertebrates. The goal of the Tennessee Aquarium is not to create a feeling of nirvana where predation never occurs, but to display a natural community with minimal negative interaction between the inhabitants. We realize that the absolute elimination of predation in mixed species exhibits is impossible, however, it can be controlled through careful species selection.

Diets and Feeding Strategy

Getting the right food to the right animal is a problem that everyone who has worked a mixed species exhibit has faced at one time or another. At the Tennessee Aquarium we incorporate several strategies in diet presentation. Within several exhibits we are faced with the problem of large aggressive fish species competing with the turtles for food. Some of our options include concurrent feeding by aquarists and herpetologists; flooding the exhibit with food in hopes that everyone gets something; feeding larger food items, such as gelatin-based foods, which can be eaten over a longer period; and the use of internet baskets that turtles must crawl into but which deny fish access to the food being offered. Each of these have advantages and disadvantages. The use of gelatin-based foods, along with offering food in places with limited fish access, has proven to be the most effective.

Diet quality is one of our most important concerns. The base of the turtle diet at the Aquarium is Turtle Brittle®, a formulated pellet produced by Nasco. In addition, Leaf Eater®, a diet created for primates by Marion Zoological, is a major component of the diet for herbivorous turtles. Gelatin-based diets are also made using the ingredients listed below. Crushed cuttlebone is currently being added to the gel diet of several species of Map Turtles (*Graptemys*) in which mussels form an important part of their wild diet. The recipes for the two gelatin diet are as follows:

Carnivore/Omnivore Gel

3 qts. Turtle Brittle® (soaked)
1 head Endive
1 large Carrot (grated)
2 Tbs. Neckton MSA (calcium supplement)
1 Tbs. Neckton Rep (multi-vitamin)
1/16 tsp. carotene
12 oz. Knox® gelatin
3 qts. hot water
(Crushed cuttlebone for *Graptemys*)

Herbivore Gel

1 qt. Turtle Brittle® (soaked)
2 qts. Leaf Eater®
1 head Endive
1 large Carrot
2 Tbs. Neckton MSA
1 Tbs. Neckton Rep
1/16 tsp. carotene
12 oz. Knox® gelatin
3 qts. hot water

Both of these recipes will make approximately 12-14 pounds of finished gel. Dry ingredients are combined in a cutter-mixer and chopped until smooth. The gelatin and water are then mixed and added. The mixture is poured into trays and allowed to set in a refrigerator. When set, the gel can be removed from the trays and cut to appropriate size pieces for feeding. The majority of the turtle collection is fed approximately three times per week. However, even on days that specific turtles are not fed, the animals forage for food items offered to other inhabitants of the exhibits, primarily thawed seafood products and fish gel diets.

Health Assessment

Daily observations play an important role in assessing the health of any animal collection. Exhibit censusing is done monthly, not only to account for all specimens but also to assess health. Within larger exhibits this may require the use of scuba gear. Animals that appear to be ill or stressed are moved to one of two off-exhibit holding areas for treatment. Early detection of illness directly affects treatment success. Individual growth records

are maintained on all reptiles in the collection. Each individual is weighed quarterly. Measurements, including carapace length, width, and height of turtles and snout to vent and total length of snakes, are recorded at least once a year. All measurements taken are straight line measurements. Forestry calipers are used to measure larger turtles and standard calipers are used on hatchlings and juveniles. Pesola hanging and OHAUS triple beam scales are used to measure weights.

Exhibit maintenance

Routine cleaning and maintenance are necessary in any exhibit, but in aquatic environments which sustain a wide variety of vertebrate fauna in closed systems, it is especially important. An ever increasing barrage of high pressure sand filters, biological filters, particulate and chemical filters, ozone and ultraviolet sterilization, etc. has become state of the art. Yet, we are constantly reminded that these are not natural ecosystems but simply our sometimes feeble attempts to recreate them. In our battle against the ever-threatening primordial soup, we have used all of the above mentioned filtration methods. Yet routine hydrocleaning and the daily chore of algae scrubbing are unavoidable in order to keep our exhibits looking their best. These tasks are more difficult to perform in some exhibits than in others. For example, a good portion of the exhibits at the Tennessee Aquarium are serviced from the public area, which incurs both time and physical constraints to complete the maintenance during non-public hours. To perform these simple routine tasks, some animals must be removed from their exhibits either with the use of shift areas or by physically catching and restraining them. The alligators present the biggest challenge with respect to safe exhibit maintenance as they must be captured and removed from the exhibit. The entire process can take up to 45 minutes and always presents the possibility of damage to the exhibit as well as stressing both the alligator and the staff involved. To address this problem, an aquatic shift area for the alligators was installed this winter. This allows for more frequent cleaning of the exhibit with a minimum of brute force.

Exhibit Modifications

During the first two years of the Tennessee Aquarium's existence, many exhibit modifications have been completed either for aesthetic or operational reasons. Several exhibits have had their undergravel lateral systems replaced to improve water flow. Additional heaters have been installed in exhibits to improve basking opportunities for the reptiles. Catwalks were installed to allow better maintenance access. Additional lighting was added to increase visibility, and improve light quality for natural plantings. An otter slide created to look like a fallen log was constructed and installed in the river otter exhibit. Concrete rockwork was added to a few exhibits to eliminate areas where snakes were resting out of public view.

Also, many of the smaller exhibits have been dressed with concrete backdrops to better represent habitats in which the display animals are found. All of these projects were done in-house as cooperative efforts between the maintenance and husbandry departments. Many exhibit enhancing projects do not need engineers and highly paid architects to be effective. Creative minds, imagination, time, and the willingness to get a little dirty are all that's needed. Nearly anyone can do some simple projects to enhance their exhibits, whether for aesthetic reasons or for the health and well-being of the animals within them.

Conclusion

Whether you like it or not, it appears that multi-taxa, habitat-based exhibits are here to stay. They are a vital component in the educational aspect of our exhibitry. If we cannot convince people of the importance of conserving the natural habitat needed to maintain the extremely complex ecosystems found on this planet, then we have not fulfilled our mission as zoo keepers/educators. Do not be afraid to broaden the types of animals maintained in your exhibits. The extra effort that you expend may be the spark which excites your visitors about the natural world.

Managing Herps in an Aquarist's World, Continued

Products Mentioned

Turtle Brittle®

NASCO

901 Janesville Ave., P.O. Box 901

Fort Atkinson, WI 53538

(800) 558-9595

RAYNGER PM Temperature Gun

Raynger

1201 Shaffer Rd.

P.O. Box 1820

Santa Cruz, CA 95061

(408) 458-1110

Stock Tanks

Rubbermaid, Inc.

Wooster, OH 44691

Neodesha Plastics

Twin Rivers Industrial Park

P.O. Box 371

Neodesha, KS 66757

(316) 325-3096

Kind and Knox Gelatin Inc.

P.O. Box 927

Sioux City, IA 51192

(800) 223-9244

Reptile Heating Pads

Valentine, Inc.

4259 S. Western Blvd.

Chicago, IL 60609

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Heating Pads

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Division of Tandy Corporation

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Restaurant Tubs

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Forestry Suppliers, Inc.

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Jackson, MS 39284

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
Florham Park, NJ 07932

(Editor's note: The preceding article was originally published in the Proceedings of the 21st National Conference of the American Association of Zoo Keepers, Inc., held Oct. 9-13, 1994 in Omaha, NE. It is reprinted here in hopes of reaching a wider audience with this information.)





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Administration Proposes ESA Exemptions for Small Landowners

Secretary of the Interior Bruce Babbitt and Dr. D. James Baker, Undersecretary of Commerce for Oceans and Atmosphere, have released a set of ten principles, designed to balance endangered species protection with economic development, that would bring significant change to the way the Endangered Species Act is implemented.

For the first time ever, significant exemptions would be granted to small property owners. The Administration will propose new regulations that would grant general exemptions from Endangered Species Act enforcement to most activities on single home residential tracts and for other activities that affect less than five acres.

The Administration package identifies ways to establish a new cooperative relationship with the states, and would require greater scrutiny of the scientific analysis supporting endangered species decisions.

"Under this plan, states would have greater ability to guide species protection and recovery within their borders," said Baker. "Science would be assured a stronger place in decision-making. Small landowners would encounter more flexibility and less regulation. And all landowners would be encouraged to provide good habitat for listed species and not be penalized for doing so."

"These principles are guideposts for reauthorization, should this Congress decide to move forward on endangered species issues," said Babbitt. The principles also show the Administration will resist radical attempts to eviscerate species protection. "As reauthorization of the ESA gets underway, any proposal for change must pass an important series of tests," said Babbitt. "Will it kill bald eagles? Will it lead to the deaths of whooping cranes or grizzly bears? Each proposed change comes with a responsibility to prove that our great natural heritage will not be squandered."

"If Congress chooses to reauthorize the Act, they should attack the Act's problems like a laser beam, while still leaving intact the law's effectiveness," said Babbitt. "A heavy-handed approach to change, as some on the Hill are suggesting, will only diminish our ability to protect species that are an essential part of the American landscape. Americans don't want that to happen."

Critics of the Act claim that individual landowners are forced to bear an unfair burden for the recovery of particular species. They point to small landowners who may be prevented from developing lands they assumed would pay for their retirement. Babbitt and other Administration officials have acknowledged their plight.

"The fact is, the Endangered Species Act has caused difficulty for some small landowners who have protected species on their property," said Babbitt. "We're saying small landowners should be exempted from conservation burdens on the basis of fairness and biology. Most species won't survive on small tracts of land and it's not fair to tie up small landowners."

The Ten Principles proposed are:

1. Base ESA decisions on sound and objective science.
2. Minimize social and economic impacts.
3. Provide quick, responsive answers and certainty to landowners.
4. Treat landowners fairly and with consideration.
5. Create incentives for landowners to conserve species.
6. Make effective use of limited public and private resources by focusing on groups of species dependent on the same habitat.
7. Prevent species from becoming endangered or threatened.
8. Promptly recover and de-list threatened and endangered species.
9. Promote efficiency and consistency.
10. Provide state, tribal and local governments with opportunities to play a greater role in carrying out the ESA.

Legislative Outlook, *Continued*

The initiatives build on the Administration's continued efforts to involve private landowners in conservation programs. In the ten years prior to the Clinton Administration, 15 habitat conservation plans (HCPs) were in effect. That number has grown to 45 in just two years, and more than 150 additional HCPs are in planning stages. President Clinton's 1996 budget includes an increase of \$27.3 million in grants to states to assist local governments and citizens in developing habitat conservation plans that allow economic development to continue while providing for the protection of threatened species.

The Endangered Species portion of the USFWS budget increases by \$6.3 million, or 9%, to \$77.7 million under the President's proposal.

> *Department of the Interior News Release 3/6/95*

Three Australia Kangaroo Species Removed from ESA

The USFWS has removed three species of large kangaroos from the ESA. The Red kangaroo, the Western gray kangaroo, and the Eastern gray kangaroo in mainland Australia were listed by the Service as threatened in 1974. The delisting action is based on the demonstrated effectiveness of the management activities of the Commonwealth of Australia and its various state governments, which should ensure the continued well-being of these species. This action exemplifies how the U.S. Endangered Species Act encourages the implementation of conservation and wildlife management programs in other countries.

The three kangaroo species are commercially harvested for meat and hides. Kangaroo management establishes annual harvest quotas based on large-scale population surveys as well as current and projected range conditions. Quotas decrease where and when kangaroo populations are low and increase where and when they are high. Kangaroo populations are estimated annually in Queensland, New South Wales, South Australia, and every three years in Western Australia. The 1993 kangaroo population estimates within the kangaroo harvest areas are 6.45 million kangaroos in New South Wales, 11.32 million in Queensland, 1.86 million in South Australia, and 1.80 million in Western Australia. Current kangaroo management activities are adapted to changing environmental conditions and naturally fluctuating kangaroo populations.

For the next five years, the Service will continue to monitor the well-being of the three kangaroo species, which could be relisted should the need arise. Still listed as endangered under the Act are a subspecies of the Eastern gray kangaroo called the Tasmanian forester, found on the island of Tasmania, as well as six species of wallabies currently or formerly found on mainland Australia and certain coastal islands.

> *U.S. Department of the Interior News Release 3/7/95*

Inadequate Law Enforcement Continues Threat to Elephants

The international ivory trade ban enacted in 1989 has not halted the illegal killing of African elephants, according to a study released in January by the World Wildlife Fund, International Union for the Conservation of Nature and the USFWS. The report, which analyzes information from nine African countries, blames the continued killings primarily on the unprecedented reductions in law enforcement budgets which have taken place in Africa. The report, entitled "Four Years After the CITES Ban", cites two dramatic examples of shrinking law enforcement budgets. In Zimbabwe the law enforcement budget has fallen nearly 90%, while in Tanzania, the drop has been 97% in wildlife areas included in the study. Budgets in most of Africa's protected areas are less than 5% of what is needed to guarantee the integrity of the protected areas and the safety of the species within them, according to the report.

The report notes that while many wealthier nations have shifted their focus to conservation of other species since the institution of the CITES ivory ban, the U.S. is alone among such nations to have established a dedicated program for funding African elephant conservation. However, the fate of even this program may be in jeopardy depending on current Congressional action.

Another concern raised in the report was the growing stockpiles of ivory held by African nations. It is estimated by TRAFFIC (the trade monitoring arm of WWF) that perhaps as much as 500 tons of ivory may be held by governments or government-authorized dealers on that continent. The report's authors call the future of such stockpiles "an issue of major international importance." Among the stockpiles estimated in the report are: Tanzania - 52 tons; Zimbabwe - 31 tons; Kenya - 5 tons; Malawi - 5 tons; and Zambia - 2.6 tons. Other sources also state that Sudan holds 48 tons and Burundi an estimated 86 tons of ivory.

The stockpiles comes primarily from confiscation although in Zimbabwe, Tanzania, and increasingly Kenya, ivory from culled animals also adds to the total tonnage. Ivory held in government stockpiles is by no means secure as many African governments do not have the financial means to insure such security. In 1993 in Tanzania, 306 tusks were stolen from the Wildlife Division's storeroom in Iringa. The report's authors are calling for "systematic registration of ivory stockpiles" to begin immediately.

>Excerpted in part from African Wildlife Update, Jan/Feb 1995 (African Wildlife News Service, P.O. Box 546, Olympia, WA 98507-0546.) An annual subscription to the African Wildlife Update is available for a contribution of \$15 or more sent to the address above. Subscriptions outside the US need to add \$7 for air mail postage.



Viewpoint.....

Giving Our Animals More Time in Their Exhibits

*by James Bousquet
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Spokane, WA 99203*

The zoo profession as a whole has changed for the better in many important ways in the last 10-15 years. Zoos spend hundreds of thousands and even millions of dollars on exhibits. We have SSPs, ARKS and unprecedented success in reproduction and research. But one thing has remained the same throughout the years. Zoos are still 9 to 5 institutions when it comes to the amount of time animals are allowed to enjoy their rich new exhibits. Most of their life is spent in lock-up in dens, barns, or sleeping houses. If their life is going to be normal it must somehow be done in a 10 x 15 foot cell. Shouldn't it be the other way around? Shouldn't most of the animal's life be spent enjoying the elaborate exhibits we have spent so much money and research developing? I believe this has been brought up before, but isn't it time we looked at how we can do something about it?

An animals' life in the zoo revolves around out schedule and the time visitors arrive and leave. Some zoos close one day a week to give their animals a break from visitors, but they are still put up for the night at 4:30 or 5:00 p.m. At best, most animals are put out in the morning at 8:30 or 9:00 a.m., so they have seven to eight hours to enjoy their living space. The next 16-17 hours, the majority of their lives, are spent in lock-up. The reality of the situation is that many animals struggle to be normal in an environment void of anything they can use to become normal. The place where they should be expected to behave normally isn't available to them long enough to be of benefit. I realize this can't be done in all cases, but wouldn't animals benefit from being out in the super mega exhibits for 16-17 hours a day; or at the very least 12 hours?

I know there will be many arguments against this program. "The animals need a break from the visitors?" Yes, they do. But, once the visitors go home doesn't it make sense to let the animals enjoy their primary living space in peace rather than in lock-up? "They may escape." Zoos use design experts and the best materials available to keep an animal

Viewpoint, Continued

from escaping. "There will be no one around to observe the animals and react to emergencies." Most zoos have night personnel who can be trained to observe these animals. I am sure this would be a pleasant change for them. Those zoos not having night personnel could stagger keeper schedules to accommodate longer out time hours for the animals. I know keepers are very possessive when it comes to their animals and their areas, but we must consider the animal in the long run and work together to find a solution to this problem. I believe this simple change in the way we manage our animals would have a very positive effect on their lives. After all, that's what it's all about, isn't it?

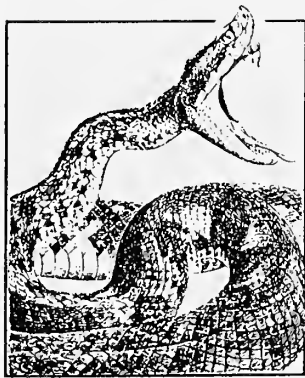
If we look at this program as it relates to each animal it would become apparent how right it is for them. Have you ever visited the zoo during a special event when the animals have been left out at night for tours? I have many times and one thing has always surprised me. The animals seem more at ease and they behave in a more normal way. They enjoy the cool of the night and I am sure they enjoy seeing the moon and stars. All of the wonderful exhibit design features and enrichment projects we worked so hard on are now available to them to use at their leisure. Animals require time to investigate their environment and develop ways to utilize their specialized adaptations and behaviors in a beneficial way. Actually, many animals like to stay up late even if they aren't nocturnal. This becomes painfully clear when we clean up the evidence of a night of energy expended in vain. A few hours a day in their primary living space isn't enough for a normal life. They require more time outside to develop their behavioral potential and learn to utilize their specialized adaptations.

Imagine this scenario - you arrive at work at 6:00 to 8:00 a.m. Your animals have been out all night enjoying their exhibit. Reports from the night staff are all normal. You prepare diets and let the animals in to eat. Then you go out on exhibit to clean, do minor maintenance and prepare enrichment materials. Out the animals go to enjoy what you have done for them. (Locking them in gives you a good chance to observe them closely.) Once all of your animals have been released for the day you can go back and clean all of the night houses. Later in the day or just before you leave for the day, you can lock them up again, clean the exhibit and put out enrichment materials. Then they are put out again. Believe me, they will learn quickly the benefits of coming in for a short time if it means meaningful activities later on. If the animals must be locked up due to shorter daylight hours or bad weather, instructions can be left for the night staff or keeper work schedules can be staggered so an experienced keeper can do lock up.

We would have to work together, communicate and trust one another as never before if we are to change such an ingrained method of animal management. In the midst of all our wonderful changes, one thing has remained the same since the inception of zoos - managing our animals' lives on a 9 to 5 schedule. Isn't it time for a change?

(The Viewpoint column offers our readers the opportunity to express their opinions on ideas and events related to zoos and zookeeping. Opinions expressed in the column are those of the author and do not necessarily reflect those of AKE or AAZK, Inc. It is at the Editor's discretion whether or not to place a submission in this column.)





A Lightweight, Easily Disinfected Shift Box for Venomous Snakes

By
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In addition to providing proper care for their captives, one of the highest priorities for herpetology departments housing venomous snakes is to ensure the safety of the keeper staff. Along that line, any method that reduces the handling of potentially dangerous specimens will likewise lower the possibility of a serious accident. Many zoos employ the use of shift or transfer boxes for moving or servicing their venomous snakes. These often take the form of a plywood box with a sliding or hinged door.

There are several disadvantages of plywood boxes. First, they are nearly impossible to properly disinfect. Corners and joints, even if painted, will inevitably accumulate fecal material that is quite difficult to remove. Secondly, wooden boxes tend to foster mite infestations, corners and joints are again the primary culprits. Thirdly, wooden shift boxes are subject to water damage and once damp, they take a long time to completely dry. Finally, these boxes are cumbersome, heavy, and aesthetically unattractive, especially when one is trying to maintain a laboratory-like appearance to an off-exhibit housing area.

Overcoming these problems is accomplished by using some readily available materials. Plastic dishpans, such as those manufactured by Rubbermaid™, are perfectly suited for use as a shift box. For larger species, busboy trays work equally well. They are extremely lightweight, durable, highly resistant to disinfecting chemicals, inexpensive, and aesthetically more appealing than wooden boxes.

To modify such a dishpan for use as a shift box the following should be done. First, make a hole in the long side of the dishpan using an expandable drill bit. As this will be the entrance for the animal, it should be appropriately sized to the species being housed. Place the hole at least an inch from the lip of the pan. Next, trace the outline of the pan's top onto a piece of plexiglass or similar material, cutting it out using a band saw, and smoothing the edges with sandpaper. Place the plexiglass aside for the time being.

To make the sliding door, cut two pieces of plastic channel slightly longer than the diameter of the entrance hole and glue these parallel to each other on either side of the hole using an epoxy cement. While the cement is drying, cut out a small rectangle of plexiglass, the size of which will allow it to slide into the plastic channels. Sand the edges and round the corners of the plexiglass slightly. (The length of this rectangle needs to be a couple of inches longer than the plastic channels.) Next, drill a 1/4" hole into one end of the plexiglass rectangle; attach a small clip to a length of 1/16" - 1/8" aircraft cable using cable clamps, and clip the cable through the 1/4" hole in the plexiglass. The length of this cable doesn't matter at this point, however, it should be long enough to reach the top of the cage and then out toward the front.

After the epoxy securing the plastic channels has dried, attach the plexiglass bottom to the dishpan using four to six bull clamps, two on each long side and one on each short side. Slide the plexiglass door into place and move the shift box, now completed, into the enclosure or cage.

Thread the aircraft cable through the screen top of the cage and cut the cable so that enough is left to reach the front of the cage when the shift door is closed. Finally, attach a small clip to the free end of the cable to secure the shift box door in an open position. If the cage does not happen to have a top ventilation screen, a small eye-screw may be installed above the box in the roof of the cage, passing the cable through this, then threading it through a small hold drilled in the cage front.

When it becomes necessary to service the cage, the shift door is lowered by the cable (making sure that all specimens are in the shift box!) and the cable unclipped from the sliding plexiglass door. The shift box can now safely be removed.

Shift Box for Venomous Snakes, Continued

There are many advantages to this system when compared to wooden boxes. The plexiglass bottom of the shift box makes it possible to closely inspect the snake without having to manually restrain it, there are no corners or joints where mites or fecal material can accumulate, it is waterproof, and the box can be completely broken down and thoroughly disinfected in only a few minutes. In addition, because of its light weight, the empty shift box can be placed onto a scale and its weight marked on the outside with a permanent marker. When the time comes to weigh a specimen, the box with the specimen inside can be placed on the scale, zeroing the scale according to the weight of the box noted earlier. Lastly, by following the underside of the snake with a piece of string (with one person holding the box and another taking measurements) it is possible to get an accurate length measurement.

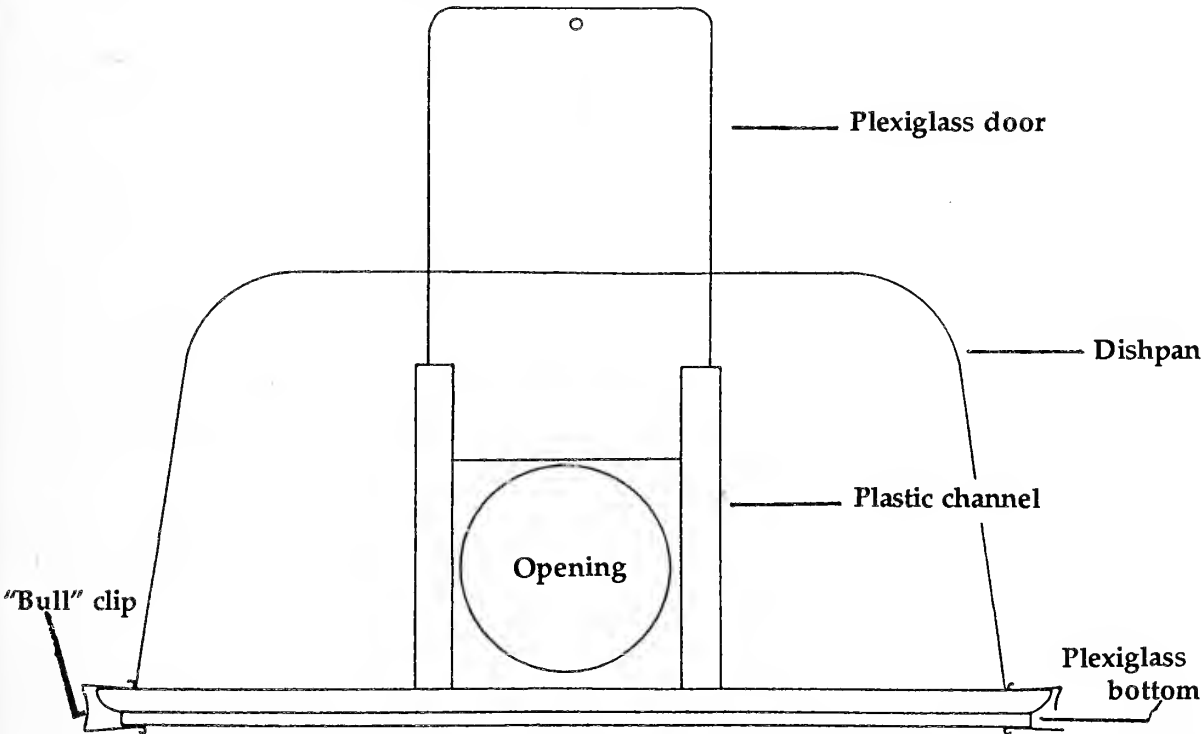


Diagram 1. Construction of shift box showing door in open position. Aircraft cable clips to hole in plexiglass door.

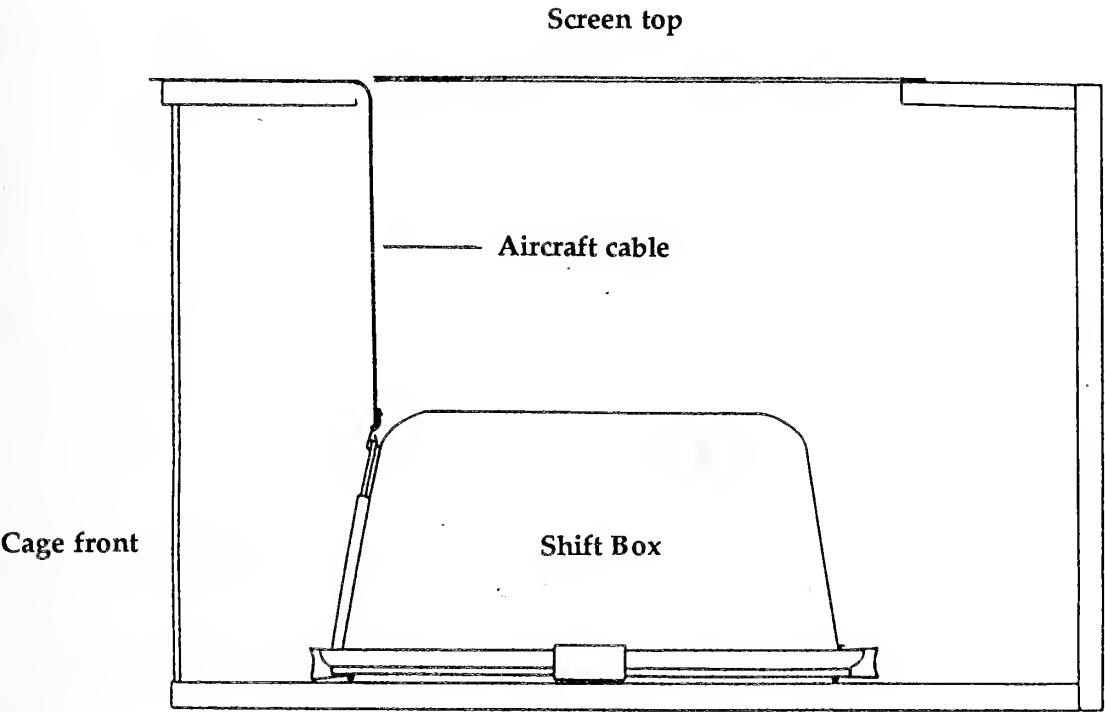


Diagram 2. Shift box in place in cage unit. Aircraft cable is threaded through screen top and clipped to cage front. Door is shown in closed position.



Chapter News

Topeka AAZK Chapter

Our new officers for 1995 are:

President.....Warren Waters
Vice President.....Darrell Agee
Secretary.....Luanne Webb
Treasurer.....Stan Dibble
Liaison.....Darrin Webb

Over the past few months our members have been hard at work putting together our education program. Topics range from threatened and endangered animals to the role of zoos. The program has met with great success (we have done over half a dozen presentations so far this year).

Since helping wildlife is an important task, our chapter again made a donation to Cheyenne Bottoms, an important wetlands habitat managed by The Nature Conservancy here in Kansas. While on the subject of wildlife, our current Spiral Wishing Well theme will focus on the animals in the collection of the Topeka Zoo. We change themes several times a year, and a portion of the money raised during each theme's tenure goes toward that project/cause. In the past we have raised money for the Mountain Gorillas, Tropical Rainforests and Environmental Enrichment.

We are pleased that some of our zoo administration staff have accepted our invitation to attend our monthly Chapter meetings. We have been able to have many questions answered (or at least discussed) at our meetings, instead of having to propose an idea, then talk to administration, and wait until the next monthly meeting to give the results to the rest of the chapter.

This spring we are going to hold a garage sale in order to raise funds for our zoo projects. The increase in Chapter members should mean that a wide array of "collectibles" will be available to everyone.

In October 1994, five of our members attended part or all of the national AAZK Conference in Omaha. We also said good-bye to Kayla Grams, our President. We wish her the best of luck at the Arizona-Sonora Desert Museum.

--Darrin Webb, Liaison

Greater San Francisco Bay Area AAZK Chapter (GSFBA)

Newly elected officers for 1995 are:

President.....Lisa Bryant
Vice President.....Ruby Lara
Treasurer.....Valerie Long-Reigel
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Newsletter.....Bill Tabb

Opportunity for Chapters to Assist Kenyan School Children

At the 1994 AAZK National Conference in Omaha, NE, Andy Lodge of the Ngare Sergoi Support Group gave an update on progress at the Sanctuary and with its resident rhino population. Andy also spoke about some of the children he had met in Kenya. Andy explained "These kids walk three miles or more to the schoolhouse, a dark building with no glass windows. There, the teacher breaks a pencil into three pieces to share among the children. When they run out of lead they must go home for the day as there is nothing else left to write with."

Andy suggested that keepers or Chapters might like to help out by providing some basic supplies necessary for education, i.e. such items as pencils, notebooks, crayons, flashcards, chalk, picture books, children's books (no textbooks), posters for the classroom, educational games or toys. Andy is helping approximately 3500 kids attending six small schools. If you would like to donate any supplies, send them directly to Andy and he will see that they get where they are most needed. Send to: Andy Lodge, 2211 Waldorf Rd., Columbus, OH 43229.



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*By Kayla Grams, Arizona-Sonora Desert Museum
and Gretchen Ziegler, Sequoia Park Zoo*

New ideas on enrichment are exciting and interesting to experiment with, but we can all benefit from reminders of excellent ideas that may have been tried before. Longtime readers of this column and other resources may already be familiar with some of these ideas, but newer readers and novice keepers could get their first exposure to them. Sometimes merely reading about a familiar idea that is perhaps worded differently or modified just slightly can get one's creative thoughts charged again. Re-examining an "old" idea from a "new" angle can lead to improved and more effective enrichment techniques. Thanks to the following keepers who submitted such effective enrichment strategies!

OTTERS - 5-6 dozen minnows and/or 5-6 dozen crawdads released live in swimming tank; otters will enthusiastically chase the prey for hours. They also enjoy hunting crickets.

--Elizabeth Murtry
Mesker Park Zoo, Evansville, IN

BEARS - Place a few fish or some fruit into a rubber bowl with some water and freeze it overnight. Place it into the bear enclosure on a hot day and it's a great cool treat for the bears and will keep them busy for awhile trying to get to the food in the ice block. Or, for a **real** bear stimulation, place live fish in their pool - this will keep them occupied for a long time and encourage natural fishing behavior (just be careful where the fish come from due to possible disease). A less naturalistic approach to enrichment for polar or black bears is to smear honey in a piece of PVC pipe (large enough to fit over their noses and possibly their paws, but small enough not to get stuck on their heads) and throw in a few berries or raisins - the bears love it!

PRIMATES - To add a little challenge to the usual paper food tubes (paper towel or toilet paper tubes stuffed with popcorn, peanut butter, etc., as described in previous issues) and to use things that are a little more natural, try using bamboo stalks instead. It is harder to destroy than paper and therefore lasts longer. Or to be even more creative and especially to stimulate the natural manipulating behavior in chimps, try cutting the bamboo into pieces at its natural sectioning, leaving the tube sealed on both ends (unlike the food tubes which are open at either end). Then drill holes around the sides only big enough for a raisin to fit through. Fill the tube with raisins and you have a natural puzzle that only gives treats when rolled, shaken, or of, course, broken in two.

--Kimberly Widner
Conservation Research Assistant
Knoxville Zoo, Knoxville, TN

ELEPHANTS - Drill some holes in a Jungle Ball® and put some food treats such as primate or omnivore biscuits inside. The elephants will roll and throw the ball around to get the food treats out. It is best to have more than one ball with multiple animals.

--Dale Brownlow, Elephant Keeper
Topeka Zoological Park, Topeka, KS

(Many other curious and food-oriented animals such as bears, certain primates, carnivores, mustelids, etc. might utilize this technique as well. Write in with any such variations you have tried. Eds.)

OLFACTORY-ORIENTED ANIMALS - While animals are shifted "over", wipe your sweat onto cage furniture in several places for the animal to investigate upon re-entering the cage.

--Kathy Kelly, Pathology
National Zoo, Washington, DC



Information Please

Information is needed on the following:

- (1) Tawny Frogmouth used in Educational Programs
 - a. Who handles it?
 - b. Does it leave zoo grounds?
 - c. Is it wing or nail clipped?
 - d. Does it get moody or ever try to build a nest?
- (2) Giant Anteater
 - a. Are both males and females housed together?
 - b. Why type of exhibit are they housed in?
 - c. When is the male separated from the female?
 - d. When is the male allowed to go back with the female after she gives birth?
 - e. How old is the baby when taken from the mother?
 - f. Is the male ever allowed to be with the female while she has her baby--if yes, how old is the baby; if no, why?

Please send any information to: Maria Browning, San Antonio Zoo - Children's Zoo, 3901 N. St. Mary's St., San Antonio, TX 78212.

A special thanks to the keepers who send me information on how often they weigh their handlable animals. Ours are now being weighed at least once a month and the Docents are allowed to help me. Thanks again!



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Zoo Infant Development Two-Volume Reference Set

*Edited by Harmony Frazier, LVT, Woodland Park Zoo, Seattle, WA and
Kathleen Hunt, B.A., Dept. of Zoology, University of Washington*



The American Association of Zoo Keepers, Inc. is pleased to announce the availability of an important reference work. This 1820-page, two volume set is a reference manual of the physical and behavioral development of parent-reared mammal infants in captive collections. These volumes include normal rearing information and weights for many species and can be quickly utilized for quick comparison and reference when deciding whether an infant is being properly cared for or is in need of intervention.

The volumes are divided into four sections: 1) Infant Development Data Sheets (a total of 419 individual records); 2) Weight Data (including many charts and graphs); 3) Bibliography (144 pages of bibliographic references) and 4) Index (species included are indexed by both common and scientific names). The Infant Development Data Sheets and the Weight Section are subdivided by color coded taxonomic order tabs. The Zoo Infant Development Notebook is packaged in two sturdy 2-inch expanded D-ring binders and include a full-size page lifter for ease of use.

To order, fill out the form below and return with your payment to: AAZK, Inc. ZIDP Notebook, 635 S.W. Gage Blvd., Topeka, KS 66606-2066 U.S.A. Checks or money orders should be made payable to "AAZK, Inc." (U.S. FUNDS ONLY). If using a credit card, make sure to complete all requested information on form. Prices are:

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Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing dates for positions available. There is no charge for this service and phone-in or FAX listings for positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.

CURATOR...the Wildlife Discovery Program (a Houston I.S.D. Magnet School) is now taking applications for the 1995-96 school year. The Curator position vacancy will become available 18 August, 1995, and continue until 31 May, 1996 (10 month contract/benefits). The duties of this position include planning and experiential instruction in an outdoor setting at the Houston Zoo to 3rd grade students. Requirements are two or more of the following: High school diploma (required); education experience; wildlife biology background; environmental/outdoor education experience; or summer camp counselor experience. Salary \$1030.00/month for 10 months with benefits. Applications will be accepted until **15 July, 1995**. Send cover letter with resumé and three (3) references to: Ms. Karyl Walz, Coordinator, Wildlife Discovery Program, 1513 North MacGregor Way, Houston, TX 77030.

ZOO ATTENDANT III/PRIMATE FACILITY...requires high school diploma and two year's experience in the management of a great ape collection. Bachelor's degree, proven interpersonal/supervisory skills and experience with a variety of primate species are preferred. Responsible for staff supervision and animal care programs as well as the care of the physical plant. Must be willing to facilitate and participate in approved research programs and do some public speaking. Salary commensurate with experience. Send letter, resumé and references to: Wanda Smallwood, Personnel Dept. City of Fort Worth, 1000 Throckmorton St., Ft. Worth, TX 76102. **Closing date for this position is 30 April 1995**

SEASONAL KEEPER/GUIDE...two (2) positions available May - October. Prior paid zoo experience preferred, volunteer experience acceptable. Applicants must be neat in appearance, have audible voice, work well with co-workers and public. Duties include, but are not limited to, giving tours to the public, all aspects of animal care. Must work with non-venomous as well as venomous reptiles. Salary - \$185.00 per week, lodging, utilities and uniforms provided. Good opportunity for paid zoo experience. Send resumé to: Soco Gardens Zoo, Jim Miller, 904 Soco Road, Maggie Valley, NC 28751. Resumés accepted until positions filled.

ZOOKEEPER...requires keeper with at least two years of hands-on experience in a paid position. The candidate must have a proven ability to work with a minimum of supervision. Duties include the daily care of cleaning, feeding and observing our collection of over 100 species as well as presenting live animal shows on a scheduled basis. We are looking for a self-starter who can get along with both fellow employees and the visiting public. We offer a competitive salary and other benefits. Send resumé and references to: Vince Hall, Claws 'N' Paws Wild Animal Park, RD 6, Lake Ariel, PA 18436. Position open until filled.

ANIMAL HANDLER II...work with large variety of animals including 0.1 Asian elephant in a small zoo setting. Duties include daily care of mammals, birds and reptiles; exhibit design; construction; and maintenance. Oral/written communication skills are vital as educational presentations are a large part of this job. Minimum requirements are three (3) years' animal related experience, high school graduate. Bachelor's degree in related field strongly preferred. Starting salary \$7.47/hour plus excellent benefits. Send resumé to: Sarah Gende, Director, Niabi Zoo, 13010 Niabi Road, Coal Valley, IL 61240.

ZOO KEEPER POSITIONS/Kansas City Zoological Gardens...requires high school diploma and one year's experience in the care, feeding and handling of zoo animals. Good communication skills desired. Responsible for daily animal care, exhibit maintenance, animal observations, and public contact. Will work with diverse collection in zoo nearing completion of a \$71 million renovation. Positions with great apes, birds, reptiles and domesticated animals currently available. Starting salary \$1,476/month with excellent benefits. Nonresidents, if appointed, must establish residency within the city limits of Kansas City, MO.. Send resumé by **1 May 1995** to: Reta Gaebler, 414 E. 12th St., 12th Floor, City Hall, Kansas City, MO 64106. EOE/MF/D.

Opportunity Knocks, Continued

SENIOR WILD ANIMAL KEEPER...requires a degree in animal science and 3+ years experience caring for mammals, birds, and/or reptiles in a zoo setting. Will be responsible for animal care and exhibit maintenance at the recently renovated Prospect Park Wildlife Center in Brooklyn, NY. Salary \$27,635.00 to start. Benefits include three (3) weeks vacation, plus health, dental, and retirement plans. Send resumé to: John Fairbairn, Human Resources, Wildlife Conservation Society, 2300 Southern Blvd., Bronx, NY 10460. Call (718) 220-5119 with inquiries.

ELEPHANT KEEPER...the Lee Richardson Zoo is seeking resumé from highly motivated, team-oriented individuals. The position requires a high school diploma and zookeeping experience. Elephant experience is preferred. A basic understanding of operant conditioning and its application to a protected contact management system is desirable. Responsibilities would include the care and maintenance of two female African elephants in a protected contact situation, as well as care of other species. Salary is \$6.69-\$8.83/hour depending on education and experience, plus excellent benefits. Send resumé to: Jeff Bullock, Lee Richardson Zoo, P.O. Box 499, Garden City, KS 67846. The position will remain open until filled.

HERPETOLOGY KEEPER...requires working knowledge of care, maintenance and breeding of amphibians and reptiles in captivity. B.S. in zoology or related field and experience with venomous species preferred. Starting salary \$19,302.00 plus excellent benefit package. Application **closing date is 30 April 1995**. Send resumé to: Nancy Foley, Director of Human Resources, The Toledo Zoological Society, P.O. Box 4010, Toledo, OH 43609.

REPTILE KEEPER...requires Bachelor's degree in Biology/related field, good physical condition/driving record, and experience with diverse groups of amphibians/reptiles (including venomous snakes and large crocodilians). Starting salary \$7.70/hr., with excellent benefits. Send resumé **by 30 April 1995** to: Gordon Henley, Zoo Director, Ellen Trout Zoo, 402 Zoo Circle, Lufkin, TX 75904. EOE.

The following three (3) positions are available at The Philadelphia Zoo. If interested, send cover letter and resumé to: Human Resources, The Philadelphia Zoo, 3400 West Girard Ave., Philadelphia, PA 19104.

ELEPHANT KEEPER...position requires a minimum of two years of experience working with elephants. Ability to work cooperatively with elephant management team essential. Responsibilities include exhibit maintenance, public education, participation in a free contact elephant management program.

KEEPER...keeper with a minimum of two (2) years of experience in captive animal care in a zoo, demonstrated ability to maintain records and talk to the public and an interest in working with a variety of animals including reptiles, hoofstock, mammals and birds.

LABORATORY/VETERINARY TECHNICIAN...provides direct technical and medical support in the care and treatment of all animal species. Degree from an accredited medical technician program and a minimum of one year of experience in the animal health field are required. Experience in microbiology, parasitology, avian/reptile hematology and demonstrated interest in exotic animals preferred.



Assistance Requested

The Riverview Park and Zoo in Peterborough, Ontario, Canada is presently designing a new primate display to be constructed in the summer of 1996. There will be two separate areas for primates. Each inside display will be approximately 20' x 25'. Each inside display will have access to an outside display which will be approximately 30' x 50'. One side will house a troop of Squirrel Monkeys and we are considering Gibbons for the other side. Is there anything we can run with these primates in the same enclosure without having any separations? For instance, can we run Macaws with the Squirrel Monkeys and maybe also some small ground animal? Remember, they will have to go indoors into the 20' x 25' area for the winter. If anyone out there has any good suggestions, we sure would appreciate hearing from you. Please send information to: Wally Davidson, Riverview Park & Zoo, P.O. Box 4125, Peterborough, Ontario, Canada K9J 6Z5.



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May 1995



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Diet Notebook Mammals, Vol. II - Susan Bunn Spencer, Grand Rapids, MI



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Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and **double-spaced**. All illustrations, graphs, charts and tables should be clearly marked, in final form, and should fit in a page size **no greater than 15cm x 25 1/2 cm (6" x 10")**. Literature used should be cited in the text (Brown, 1986) and alphabetically in final bibliography. Avoid footnotes. Include scientific name of species (as per ISIS) the first time it is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs., etc.). Black and white photos **only** are accepted. Color slides should be converted to black and white glossy prints (minimum size 3" x 5") before submission. Clearly marked captions should accompany photos. Please list photo credit on back on photo.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

DEADLINE FOR EACH ISSUE IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association. Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$2.00 each.

*This month's cover features a Florida Panther (*Felis concolor coryi*) drawn by Jeff Gerencser, an Aviculturist at the International Crane Foundation in Baraboo, WI. The Florida Panther is listed as endangered with possibly less than 30-50 individuals remaining in the wild. It is a large, long-tailed, uniformly brown cat reaching a maximum length of about 2m (7 ft.). These cats occupy habitat that supports substantial deer populations and they may travel up to 32km (20 mi.) in a single day. Once found throughout Florida, remaining populations are now found in the Everglades National Park and Big Cypress National Preserve. The females produce litters of 2-3 young every 2-3 years in dens under fallen trees or in dense brush. Their demise has been caused by the extraordinary habitat destruction brought on by the 100 new citizens who come to live in Florida each day. Car accidents are another leading cause of mortality. Thanks, Jeff!*

Scoops

and

Scuttlebutt

Chapter Donations Continue to Support AAZK and Its Projects

The AAZK Board of Directors and the staff of Administrative Offices wish to thank the following Chapters for their generous donations to AAZK and its projects: Greater Cincinnati Chapter of AAZK, Cincinnati, OH (\$150.00) and The Milwaukee Chapter AAZK, Milwaukee, WI (\$100.00). Both donations were unrestricted and will be used for the general operating fund of the Association. Our sincere appreciation to all members of the Greater Cincinnati and Milwaukee Chapters for their support of their professional association.

Additionally, AAZK has received a donation of \$100.00 from the Columbus Zoo to help support the Animal Data Transfer Form (ADT) Project. The ADT Forms provide a vital information link between keepers and veterinary staff when animals are shipped from one facility to another. ADT Forms, under the Coordination of Bernie Feldman, are provided free of charge to any institution requesting them. This is done as a professional service of AAZK, Inc. If your facility is not already using the ADT Form, please encourage your administration to implement its use whenever an animal is shipped. Forms may be obtained by contacting: Bernie Feldman, Burnet Park Zoo, One Conservation Place, Syracuse, NY 13204. Thank you, Columbus Zoo!

Reminder on Dedicated Issues

A reminder to all members that the editorial staff of AKF is continuing to seek articles for two upcoming dedicated issues in August. Deadline for submission of these articles is **1 July 1995**. Authors are encouraged to send black & white photos, if possible, to include with their article. The second dedicated issue for which we are soliciting articles is on various aspects of Shorebird Husbandry and Breeding. Deadline for submission of articles for this issue is **1 September 1995**. We are currently gathering information on the Species Survival Plan for a possible special issue on the many facets of this program. No issue date is set as yet for this topic.

The editorial staff is currently working on some format changes for AKF and we hope to be able to present a "new" look for your journal in the near future. We continue to ask your support by submitting articles, news items, artwork, etc. to share with your colleagues.

Two Deadline Dates to Remember

- Deadline for return of nominations for AAZK Awards to be presented at the Denver Conference is 1 JUNE 1995. These include: Excellence in Zookeeping, Meritorious Achievement, Certificate of Merit for Zookeeper Education, Exhibit Renovation, and Lifetime Achievement. Nomination criteria for these awards appeared in the January-April issues of **AKF**.

- Deadline for return of ballots by Professional members wishing to cast their vote for the new Board of Directors - ballots were mailed 1 April and must be returned in the envelope provided by 1 JUNE 1995. Do not include anything other than the ballot in this envelope as it goes to the CPA firm which is tabulating the ballots and not to Administrative Offices. Including publication orders or membership renewals in this envelope will result in delays in service.



Message From the President

This is a Board of Directors election year. All Professional members of our Association should assume the responsibility of reading the five nominee resumé and voting to fill the three positions which are available. All Professional members whose membership was "in good standing" as of 31 March 1995 were sent an election packet containing nominee resumé, a ballot and a return envelope addressed to the CPA who will tabulate the results. Ballots must be returned in the envelope provided by 1 June 1995. The newly elected Board members will assume their duties right after the Denver Conference.

Susan Barnard (Zoo Atlanta), who has served as Chair of the Research/Grants Committee since 1989, is resigning that position due to increasing work demands at her institution. Those interested in this position may contact Alan Baker, Board overseer for this Committee. They may contact Alan at the Burnet Park Zoo, One Conservation Place, Syracuse, NY 13204. Alan can provide you with information on what this position entails and how the Committee works.

Janet McCoy, President AAZK, Inc.
Metro Washington Park Zoo, Portland, OR

Zookeeper Teddy Bears Available

The AZA Chiropteran Taxon Advisory Group's Keeper Subcommittee is selling Zookeeper Teddy bears as a fundraising project to help develop an Educator's Notebook for the TAG. These are handmade by the Vermont Teddy Bear company and come with a lifetime guarantee. They are dressed in khaki colored uniforms, stand 16" tall, and come with a bucket, scrub brush and radio. Available in sandy beige, brown or honey. Cost is \$69.99 each; order two or more for \$64.99 each. Shipment after receipt of order takes 7-10 days. Shipping and handling charges are \$2.50 for the first two bears and \$1.50 for each additional bear. Extra shipping boxes for your bear are \$1.50 each. To order send name, complete mailing address, number and color of bears desired to: Pete Riger, Wildlife Conservation Park, 185th & Southern Blvd., Bronx, NY 10460. Make checks payable to "Folsom Children's Zoo". Questions? Contact Kim Tropea or Pete Riger at (718) 220-5046.



Letters to the Editor

(The following letter was sent to AKF in response to notices which have appeared in the March and April issue about the Zoo Studies Program at Friends University, Wichita, KS. The letter expresses only the opinion of the author which was formed during her experience with the program.)

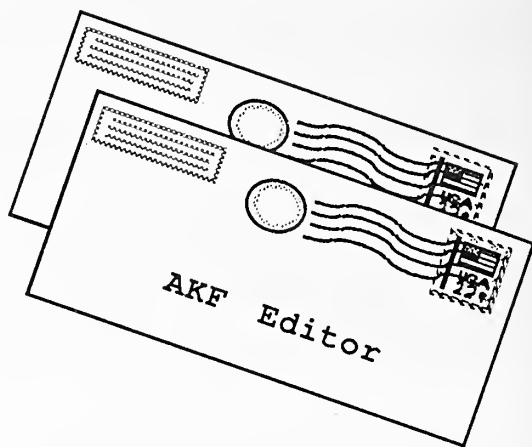
Dear AKF,

The Masters of Science in Environmental Science program at Friends University in Wichita, KS is a 21-month program. Within this program, classes meet Monday evenings and 360 clock hours of practicum is required. Students in this program may complete their practicum in the fields of environmental science or zoo education.

Courses are eight weeks long and range from the natural History of Invertebrates to Environmental Law. The course work consists of 27 credit hours, the practicum is 6 credit hours, and the directed study is 3 credit hours.

Your grade during the coursework is based on class participation and papers that are written. There are no midterms or finals to take. If you choose the zoo education route, you are also encouraged to sit in on the undergraduate zoo science classes. During these classes, you are asked to take their exams and do the assigned homework even though these classes are not part of the masters program.

During the zoo education practicum, all of your practicum is completed at the Sedgwick County Zoo. Phase I is an overview and is 160 clock hours. The student will spend a certain number of hours in each department of the zoo, the most time spent in the mammal department, and will then write a paper about his or her experience. Phase II is 140 clock hours and is noted as the area of specialization. In this phase, the student chooses one area in which to spend 140 hours or spend 70 hours each in two areas. The last phase is the directed study and totals 60 hours. This is the area in which a major research project will be conducted.



As a student who went through the zoo education program, I found that the program was somewhat redundant. I found myself working with the same species as I have throughout my zookeeping career. For me, some of the zookeepers whom I worked with would discuss certain behaviors of species that I had also worked with; would ask me what I would do for this and that, and would value my opinion on an idea about an animal or an exhibit design. Since I did work with some new species, I did learn different behaviors and zookeeping techniques.

For me, the program was not what I thought it would be. I was a student for eight weeks and then withdrew from the program. As a zookeeper, I found that the practicum wasn't challenging and that the classes were easier than my undergraduate studies.

Tammy Root,
Keeper, Topeka Zoo, Topeka, KS

Need to Reach AAZK?

1-800-242-4519 (U.S.)

1-800-468-1966 (Canada)

FAX: (913) 273-1980

or write

**AAZK, Inc.
635 S.W. Gage Blvd.
Topeka, KS 66606-2066**

Coming Events

18th Meeting of the American Society of Primatologists

June 21-24, 1995

Scottsdale, AZ

Hosted jointly by the Primate Foundation of Arizona and Arizona State University, the meeting will be held at the Safari Resort in this Phoenix suburb. Scientific sessions convene on Thursday morning of 22 June and continue through Saturday afternoon of 24 June. Additional information is available from: Jo Fritz, Primate Foundation of Arizona, P. O. Box 20027, Mesa, AZ 85277-0027; voice: (602) 832-3780; FAX - (602) 830-7039; e-mail: 75031.3052@compuserve.com.

Zoos: Committing to Conservation

July 13-16, 1995

Columbus, OH

Hosted by the Columbus Zoo. For further information, contact Beth Armstrong, The Columbus Zoo, Box 400, 9990 Riverside Dr., Powell, OH 43065-0400; (614) 645-3426.

Tenth International Conference on Bear Research and Management

July 16-20, 1995

Fairbanks, AK

For additional information on registration contact: Conferences and Special Events, 104 Eielson Building, P.O. Box 757800, Fairbanks, AK 99775-7800, Phone (907) 474-7800, Fax (907) 474-5592, E-mail fyci@aurora.alaska.edu.

15th Annual Association of Zoological Horticulture Conference

July 22-25, 1995

Montreal, Canada

Hosted by the Montréal Biodôme. AZH will be meeting concurrently with the American Association of Botanical Gardens and Arboreta and their host institution, the Montréal Botanical Garden. Conference and hotel registration deadlines are 15 June 1995. For further information contact: Stéphanie Labelle, Biodôme de Montréal, Tel. (514) 868-3046, Fax (514) 868-3065.

21st Convention of the American Federation of Aviculture (AFA)

August 9-12, 1995

New Orleans, LA

This year's conference will focus on Central and South American avian species. For more information contact the AFA Business Office at (602) 484-0931.

AAZV/WDA/AAWV 1995 Joint Conference

August 12-17, 1995

East Lansing, MI

Conference will be held jointly with the American Association of Zoo Veterinarians (AAZV), the Wildlife Disease Association, and the American Association of Wildlife Veterinarians. Program will include paper sessions, workshops, student and graduate competition and poster session. For conference information contact Wilbur Amand, VMD Executive Director, 3400 W. Girard Ave., Philadelphia, PA 19104-1196; phone (215) 387-9094; FAX (215) 387-2165.

The International Society of Zooculturist Annual Conference

August 23-26, 1995

Idaho Falls, ID

To be held at the Tautphaus Park Zoo. For more information contact: Bill Gersonde, Superintendent, Tautphaus Park Zoo, Box 50220, Idaho Falls, ID 83405. (208) 528-5552.

Coming Events, Continued

The 16th Annual Elephant Managers Workshop

October 10-14, 1995

Tacoma, WA

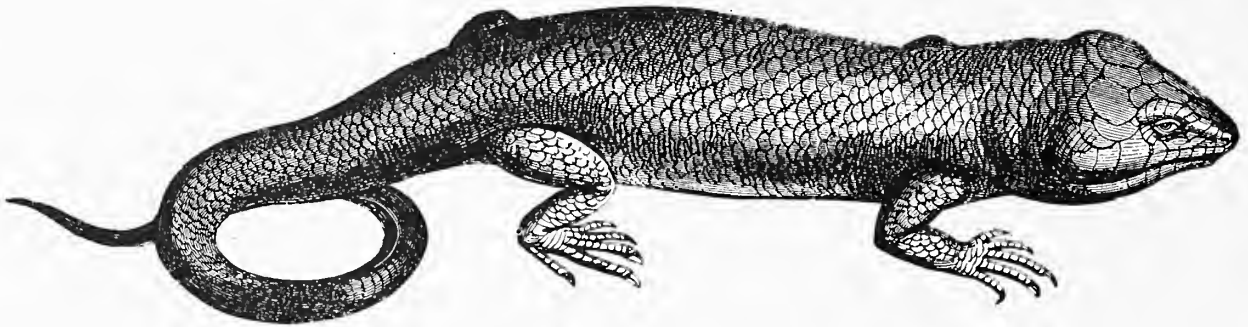
Headquartered at the Tacoma Inn. For further information contact: Bruce Upchurch or Sally LaTorres, Point Defiance Zoo & Aquarium, 5400 N. Pearl St., Tacoma, WA 98407-3218, (206) 591-5337, ext. 154.

Second Annual Conference of the Association of Reptile and Amphibian Veterinarians

October 26-29, 1995

Sacramento, CA

Will include Scientific Program, Wet Labs/Workshops and a Trip to the Sacramento Zoo. For conference registration information contact: Wilbur Amand, VMD, P.O. Box 605, 1 Smithbridge Rd., Chester Heights, PA 19017; Fax (215) 387-2165.



AAZK Announces New Professional/Contributing Members

Kevin S. Wilson, Cape May County Zoo (NJ)
Guy J. Mattola, National Aviary (PA)
Cheryl Ladota, Baltimore Zoo (MD)
Trista Lowell, Sasquatch Zoo (FL)
Michelle Collins, Busch Gardens (FL)
Mike Hayes, Birmingham Zoo (AL)
Bonnie Van Dam, Detroit Zoo (MI)
Teresa Lienemann, Henry Doorly Zoo (NE)
Jim Matthews, San Antonio Zoo (TX)
Jerry L. Fischer, San Antonio Zoo (TX)
Celina Gomez, San Antonio Zoo (TX)
Wendy Hall, San Antonio Zoo (TX)
Deanna Keckler, San Antonio Zoo (TX)
David Nix, San Diego Wild Animal Prk. (CA)
Roger Peterson, San Diego Wild Animal Prk. (CA)
Mike Wyche, Cat Tales (WA)

Thomas Goralczyk, Six Flags Safari Prk. (NJ)
Sheila Sykes, Philadelphia Zoo (PA)
Anne S. Davis, Riverbanks Zoo (SC)
Laura Vietje, Lowry Park Zoo (FL)
Lanni Hall, Birmingham Zoo (AL)
Jamie Ashcraft, Washington Prk. Zoo (IN)
Teresa Brown, Myrick Park Zoo (WI)
Vonceil Wieland, Oklahoma City Zoo (OK)
Maria Browning, San Antonio Zoo (TX)
Gilbert Gomez, San Antonio Zoo (TX)
Jeff Perry, San Antonio Zoo (TX)
Guy Bulingame, San Antonio Zoo (TX)
Charles Purvis, Utah's Hogle Zoo (UT)
Donna Kent, San Diego Wild Animal Prk. (CA)
Christy McVey, Moonridge Animal Prk. (CA)
Debbie Wyche, Cat Tales (WA)

Joe Sullivan, Cat Tales (WA)

New Contributing Members

Susan Janik, Miami, FL

Renewing Contributing Members

Bonnie Jacobs, Lincoln Park Zoo, Chicago, IL
David G. Westbrook, Director, Little Rock Zoo, Little Rock, AR
Peter W. Shannon, Makawao, HI



THE SHAPE OF ENRICHMENT

The Shape of Enrichment is dedicated to sharing ideas, inspiration, and practical knowledge of environmental & behavioral enrichment strategies among those working in the field of animal care. It is an open forum for keepers, trainers, curators, researchers, administrators, exhibit designers, volunteers and anyone else interested to exchange techniques and approaches to captive enrichment.

The Shape of Enrichment is designed as a vehicle to present enrichment ideas of all kinds from a variety of sources. We urge you to consider, assess, and evaluate any idea carefully before applying it to your animals and exhibits. If you have concerns or opposing views, we will be happy to accept letters and articles that express them--our purpose is to establish ongoing dialogue that presents both sides of controversial issues as well as ideas that are more generally accepted. As the editors, we present these ideas for your consideration only; we do not take responsibility for their effectiveness or feasibility.

We are always looking for new submissions, from feature-length articles to short blurbs. We accept submissions in any form, polished or not. Let us, and your colleagues, hear from you!

The Shape of Enrichment is published quarterly. Subscriptions are \$12.00 per calendar year, payable in U.S. funds only, drawn on a U.S. bank. The \$12.00 fee includes postage, both domestic and foreign air mail. Mid-year subscriptions are prorated. Back issues are available for \$3.00 each. Send all subscription requests, article submissions, letters, comments, and questions to: 1650 Minden Dr., San Diego, CA 92111-7124. Be sure to include your name and complete mailing address when placing a subscription order.

*Valerie J. Hare and Karen E. Worley
Editors, The Shape of Enrichment*

The Editorial staff of *Animal Keepers' Forum* wish to thank Valerie and Karen for allowing us to include material from *The Shape of Enrichment* in this special issue dedicated to enrichment. We would encourage AKF readers to also contribute to *The Shape of Enrichment* and to benefit from the wealth of information each issue contains by subscribing now.

Births & Hatchings



Denver Zoo (Denver, CO)...announces the following B&H from January through March 1995:

Mammals - 0.1 Lesser kudu (*Tragelaphus imberbis*); 2.0 Colobus monkey (*Colobus guereza kikuyuensis*) [CITES II]; 1.1 Warthog (*Phacochoerus aethiopicus*); 0.1 Addra gazelle (*Gazella dama ruficollis*) [CITES I]; 0.0.1 Golden lion tamarin (*Leontopithecus rosalia rosalia*) [E/CITES I/SSP].

Birds - 0.0.1 Bartlett's bleeding heart dove (*Gallicolumba criniger*) [CITES II]; 0.0.5 East African crowned crane (*Balearica regulorum gibbericeps*) [CITES II]; 0.0.1 Nicobar pigeon (*Caloenas nicobarica*) [CITES I].

Reptiles/Fish - 0.0.2 Flat-tailed day gecko (*Phelsuma laticauda*) [CITES II]; 0.0.6 Four-eyed fish (*Anibleps anibleps*). submitted by Vicki Sawyer, Denver Zoo.

Buffalo Zoological Gardens (Buffalo, NY)...announces the following B&H for 1994:

Mammals - 1.0 Western lowland gorilla (*Gorilla g. gorilla*) [E]; 2.1 Clouded leopard (*Panthera nebulosa*) [E/SSP]; 2.1.1 Cotton-top tamarin (*Saguinus oedipus*) [E]; 4.0 Roan antelope (*Hippotragus equinus cottini*) [T]; 7.1 Markhor (*Capra falconeri cashmiriensis*) [E].

Birds - 0.1 Andean condor (*Vultur gryphus*) [E]; 0.1 White-naped crane (*Grus vipio*) [E/SSP].

Reptiles - 0.0.7 European glass lizard (*Ophisaurus apodus*) [husbandry change]; 0.0.1 Solomon tree skink (*Corucia zebrata*) [T] [DNS]; 0.0.8 Red-footed tortoise (*Geochelone carbonaria*) [1st time hatching from group]. submitted by Sherri Doherty, Secretary, Western New York Chapter of AAZK, Buffalo Zoo, Buffalo, NY.



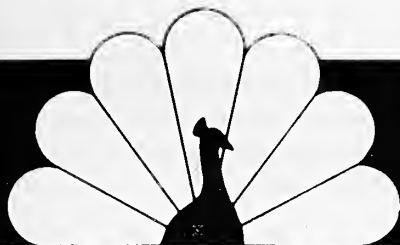
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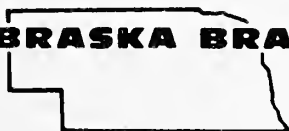
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Primate Enrichment

submitted by
Kelley Bollen, Keeper,
Burnet Park Zoo
Syracuse, NY

At the Burnet Park Zoo we have an intensive enrichment program for our primates. We house seven different species, from prosimians to lesser apes. Each group received some sort of enrichment practice nearly every day, whether it be a toy, forage spread in the substrate, or a unique food presentation device. A weekly schedule for each species shows which practice will be on which day. We have an evaluation column on the schedule where a + or - indicates the use of the enrichment items on a daily basis.

We also have developed an evaluation form which is used for each new enrichment device we try. This form rates the reaction to the enrichment within the first 15 minutes and denotes if the device is being used at 2, 4 and 6 hours after presentation. A section for evaluation at a later date (for example, are they still interested in the enrichment after receiving it every Thursday for two months?) is included. This system of scheduling and evaluating the enrichment was adopted from the article "The Development of an Enrichment Masterplan" by Allie Dewey, *AKF*, January 1995.

We are also developing signs that will be hung on the outside of the exhibit explaining the purpose of enrichment and what item is offered at the time. Our signs read:

Behavioral Enrichment in Progress:
(Indicates practice with short duration)

**To Provide a Captive Environment
that Stimulates Natural Behaviors
and Increases Activity Levels**

We are constantly looking for new ideas from colleagues as well as developing ideas on our own. Listed below are a few

food presentation devices we have tried with great success and which I have not read about elsewhere.

Foraging Log - Wrap plastic artificial turf around a log, be sure the turf is tight to the log and secure it with nails long enough that they cannot be pulled out. Add a hanger from the top (an S-hook with a two-way clip works well). Stick raisins or other small food items in the turf. The primates spend a good deal of time picking the food out.

Sticky Treat Log - Spread a thin coat of corn syrup on a log with smooth bark. Stick food items such as mealworms, raisins, and seeds to the syrup and hang.

For ruffed lemurs we spread small dabs of the corn syrup on the vines, trees, and rocks throughout the exhibit. The syrup is clear so the lemurs must find it by smell (it is also invisible to the zoo visitors). The group stays active for a long time searching for the sweet treat.

Sap Dripper - Drill a chamber down the middle of a log. Drill tiny holes around the log leading into the chamber. Pour syrup inside the chamber, plug the top with a cork and hang. The syrup slowly leaks out of the holes and the primates lick it up (great for Tamarins).

Cricket/Mealworm Feeder Log - Same idea as the sap dipper but make the holes leading into the chamber large enough for the mealworms or crickets to crawl out.

Foraging Items - In addition to the more common forage items such as seeds, popcorn, cereals, grains, nuts, and raw pasta, we have just discovered that our primates love shredded coconut, dry split peas, and frozen vegetables, such as peas and corn, spread in the substrate.

Toys - We have been giving a string-type mop head to our gibbons, siamang and mandrills. This makes for a fun and safe toy.



Enrichment Planning Considerations

*By Else Poulsen, Keeper,
Calgary Zoo Alberta, Canada*

The Calgary Zoo has a long-standing history with environmental enrichment. As one of my colleagues pointed out, enrichment has always been in the keeper contract—we call it care. When I started as a keeper, my first enrichment attempts were primitive—sometimes conceived out of concern for an animal's obvious problem, and sometimes out of a selfish desire to see certain behaviors. But as my experience, knowledge, and ability to network with staff has improved, so has my desire to target specific enclosure design and behavior problems. To plan successful enrichment events, we need to be aware of and organize the way we approach enrichment.

Choosing An Animal Or Species

When you are faced with an entire zoo full of animals, all of which would benefit from enrichment, and your time and budget are limited, which animals do you choose? It makes sense to start with the most needy of the collection. Need can be assessed on the basis of any of the following parameters:

1. Animals that are not living in appropriate social groups.
2. Animals with special health care requirements.
3. Hand-raised animals about to be introduced to a group, mate, or multi-species exhibit, which require knowledge of their own dexterity and natural abilities.
4. Animals exhibiting stereotypes.
5. Animals living in enclosures that are not natural habitat exhibits.
6. Animals in appropriate social groups or naturalistic exhibits where enrichment would create incentive to carry out their natural repertoire of activities.

Know Your Animal

Often bringing out any activity or behavior in an animal is an improvement, but you can be selective by assessing which behavior would most benefit that animal. Disasters in enrichment can be avoided with some forethought. As a matter of course, most of us research the following:

1. Individual records (behavioral and medical).
2. Natural history of the species.
3. Interspecific and intraspecific agonistic behaviors within an enclosure.
4. Current individual personality (e.g. timid or curious).
5. Current position within a hierarchy.
6. Current food gathering style and possible preferences, since food is often used as an initiation leading to activity.
7. Current dexterity—An animal that has not been enriched may not initially have the same dexterity as its wild counterpart.
8. Personal locomotor style (an old, arthritic bear will move with a style unique to its physical limitation).

Starting Your Enrichment

The most important point I would like to make here is to **START SLOWLY**. I simply cannot emphasize that point enough. An animal that has not been previously enriched can become extremely stressed by foreign materials, even foods that it has never encountered before. You run the risk of scaring the animal, perplexing it to the point of confusion, or inducing displacement behavior, aggression, or stereotypic behaviors.

In wanting to bring out a certain behavior, it is useful to assess where the animal would express that behavior in the wild. The animal's natural habitat and niche is composed of

Enrichment Planning Considerations. *Continued*

three parts: permanent structures like trees, rocks, rivers; ephemeral events or structures, such as photoperiod, temperature, ground substrate, seasons; and constant changes like the location and availability of food and flexibility in the ease of the catch.

The shape of its niche in terms of what is permanent, ephemeral, or changes constantly is species specific. The animal uses its behavioral repertoire differently depending on the current state of the niche. Therefore, you can lock into a certain behavior by mimicking a certain state within the captive environment. Also, studying and mentally dissecting the animal's niche will give you an idea of why the animal may only use an event at certain times.

Take time to SLOWLY acclimate animals to changes in routine, objects, cage furniture, and so on. Remember, the animal is suddenly being placed into a state of learning, as is the keeper.

Restrictions

Some would say that enrichment is only limited by the keeper's creativity. Although this statement may be somewhat exaggerated, I do believe there is some truth to it. The many restrictions that keepers work with actually set the parameters within which their creativity can function. These restrictions-or should we say challenges-include the following:

1. The event must be doable, it must target the right individual or problem, it must not overfeed the animal, and it must not be hazardous.
2. The materials used must consider the budget, must not be able to be used as a weapon, or be otherwise injurious, must be nontoxic if eaten, and must be durable enough to withstand the intention of the event.
3. For the keeper, it's important to consider the support of your colleagues, the support and understanding of the public, and the safety of keepers and other staff (for instance, if moving large carnivores into areas out of their normal routine, communicate this to co-workers).
4. Time is perhaps the biggest challenge. Due to economic restraints, keepers are often trying to provide better care for a greater number of animals. When considering the time it takes to enrich our animals' lives, take into account the following:
 - a. Creative time- this not only includes on-site thinking but also inventing that perfect enrichment gadget as you drive to the dentist.
 - b. Research time- reading literature and discussion.
 - c. Evaluation of the idea- modifying, expanding, or disregarding it.
 - d. Construction time.
 - e. Prep time for the animals.
 - f. Implementation.
 - g. Observation time--before, during, and after an event.
 - h. Clean-up.
 - i. Making notes or report writing.
 - j. Writing up your article for *The Shape of Enrichment*.

Evaluating Your Event

On an elemental level, anything that causes an animal to think, change, or choose is enrichment, and enrichment is success. Often when the event did not turn out as you had planned, it helps to think of it as a success on a larger scale, thus giving you incentive to continue with your quest to help that animal. This, of course, does not include events that lead to violence, injury, or undue stress.

Practical Considerations

Randomness: If you think it's difficult to change an animal's habits, try changing your own! I was attempting to perform random scatter feedings for our polar bears. It wasn't long before I discovered that my supposed "random" feedings were taking place at exactly the same time every day. Obviously, I needed some guidance to break my own habits. I took small slips of paper and wrote down times of the day in 15-minute intervals. I placed them in a jar, and every morning I would pick three to four random times and worked my routine around those feedings.

Enrichment Planning Considerations. *Continued*

Staying one step ahead of the game: Once the enrichment bug bites, you realize that it is not enough to enrich periodically. Enrichment must become a way of life for the keeper, and the challenge is to be continuously thinking of new ideas. Once enrichment is started with an animal, that individual usually begins to anticipate change. There must be some continuity in the planning of enrichment.

Keeper Rewards

The most immediate and obvious reward for the keeper is watching an animal take advantage of your event. There is an element of unpredictability in the animal's reactions that is often surprising and amusing. If you interest other staff members of all departments by inviting them to come and observe with you, you may be rewarded by renewed interest in an animal that you may have felt has been forgotten. Supervisors may even find the money for those enclosure renovations you've been suggesting.

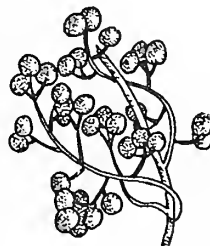
You are making a direct difference, often quantifiable, to the animals' lives. This will generate enthusiasm with zoo visitors, and they in turn, will reward the zoo by increasing their attendance. As you progress, one event tends to generate ideas for the next, thus keeping the creative flow moving. And research possibilities leap out at you, demanding definition. Environmental enrichment is a progressive affair. There are no failures, only learning experiences.

(Reprinted in part with permission from The Shape of Enrichment, Vol. 3, No. 1 February 1994)



A Garden of Enrichment

*By Jan Vermeer, Primate Keeper
Apeneul, Apeldoorn, Holland*



Apeneul Zoo specializes in exhibiting primates in a free-ranging, natural environment. Visitors become a part of the animals' environment as they walk through the zoo. Our woolly monkeys (*Lagothrix lagotricha*) roam over 1.5 hectares (3.7 acres) of forested land.

About ten years ago, we started growing a small herb garden for our animals. At the time, some herbs were introduced to our woolly monkeys (*Lagothrix lagotricha*), but the garden remained small. In 1990, we started again by laying out some new herb gardens and working with an herb specialist.

In planting these gardens, we were especially aware of the medical effects of the herbs. We examined the typical health problems of our woolly monkeys and chose herb plants that would be effective against these problems. We have planted herbs that help with stress, such as *Matricaria chamomilla*, *Nepeta cataria*, and *Lavendula angustifolia*; hypertension, such as *Allium sativum* and *Crataegus oxyacantha* and bladder infections, such as *Berberis vulgaris* and *Foeniculum vulgare*.

Later, we began introducing other plant species, because we determined that the plants served other purposes as well. As we see it, our herb gardens have the following functions:

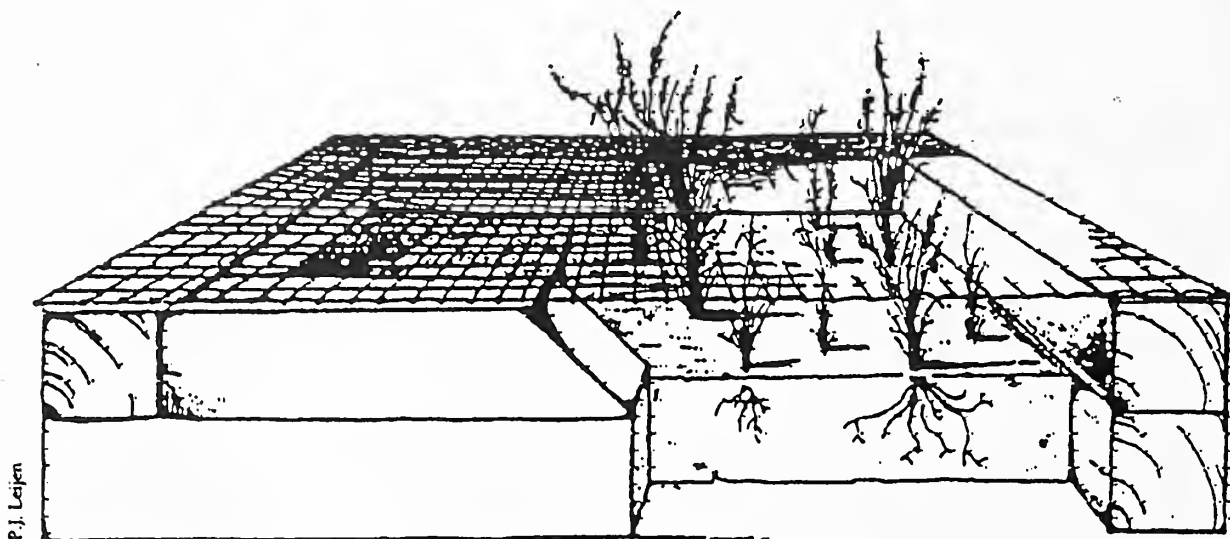
1. Medical: Many herbs have medicinal compounds, and if the monkeys have access to the plants, they can treat their own diseases.
2. Environmental Enrichment: The animals are spending a lot of time searching for different species of plants, not only because of their medicinal compounds but also because of their taste. Both seeking out and eating the herbs can occupy a lot of the monkeys' time.

A Garden of Enrichment. *Continued*

3. Education: The public has reacted very enthusiastically to our herb project. We not only have an opportunity to tell them more about our way of keeping animals but also about herb use by animals in the wild. The flowers of the herb plants also give the zoo a lot of color, and the public gets more of the feeling that the animals are living in a natural environment.
4. Diet Enrichment: All these different plants, with their different nutritional values, provide the animals with an extremely varied diet. The many insects that are attracted to the flowers of the herbs are also eaten and form another part of the diet. The searching for and catching of insects also takes a lot of time, which prevents boredom.

We are careful about using herbs that might be toxic, despite the fact that they might have an important medical function. We think that the monkeys will recognize most toxic species because of their bad taste, but we are not taking any risks. We do use several species that are lightly toxic in some parts but are healthy in the others, such as *Berberis* and *Juniperus*.

In 1993, we counted more than 150 different plant species in our woolly monkey area. Of course, our way of keeping animals—having them roam over large areas—makes it easier to create these herb gardens, but it would also be possible in a cage environment. Here, it would work well to use the system that we use for new plants and plants that are eaten or destroyed a lot by the animals. We plant these under a piece of wire mesh with only small holes (see diagram). This way, the animals can only eat the part of the plant that grows above the mesh. The plant stays rooted and keeps growing.



Growing the herbs through wire mesh protects the roots.

It is very difficult to prove that South American species of monkeys know the therapeutic effect of Dutch herbs, especially because the animals will probably have already eaten their "medicine" before we see that they have a health problem. A strong indication, however, was given to us in the summer of 1990. One of the woolly monkeys from one of our island areas (Apenheul has several different woolly monkey groups with a total of 37 animals) jumped into the water and swam to a different troop. The woolly monkeys in this troop became very excited, and their reaction was to go to one of the herb gardens and eat plants that would reduce stress.

The environmental enrichment function can be as important as the medicinal function. Boredom and its consequences (e.g. aggression, stress) often causes more problems than bacteria and other pathogens, and everything possible should be done to prevent it. We often see a small group of our woolly monkeys making the rounds through their area, searching for interesting food tidbits. The flowers of the herb plants are a delicacy, but, unfortunately, they sometimes prefer the roots.

A Garden of Enrichment. Continued

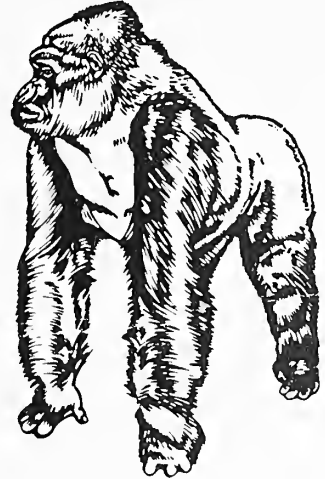
The woolly monkeys are not the only species using the herb gardens. Other species that share the area with the woollies-like sakis, marmosets, tamarins, capuchins, and lemurs have also been observed eating the plants. Monkeys in other areas, like our squirrel monkeys, have also shown an interest in the herbs. We now see our herb garden project not only as a nice experiment but also as an important part of the way we keep our primates.

(Reprinted with permission from The Shape of Enrichment Vol. 3, No. 4 - November 1994)



Animal Enrichment at the Columbus Zoo

By Dianna Frisch, Head Keeper/Bonobos
Lori Monska-Wright, Head Keeper/Cats
Columbus Zoo, Powell, Ohio



Keeping animals stimulated and mentally challenged in a zoo environment can be an enriching challenge for the keeper staff as well as the animals involved.

Being aware that mental health can relate to the physical health of the animals, enrichment has moved to become one of the most important responsibilities of today's zoo staff.

Gorilla Enrichment

A new gorilla exhibit built in 1984 gave the Columbus Zoo's gorilla (*Gorilla g. gorilla*) collection a new lease on life. However, once the animals had become familiar with their new home the boredom of the routine set in and many of the stereotypical behaviors that had disappeared, returned. The keeper staff set out to make changes in family groups and enrichment items to keep their charges active and challenged.

The outside gorilla yard is a grassy area enclosed by 10.16cm x 10.16cm (4" x 4") wire mesh. This allowed for yearly changes and additions without worry of building an escape route for the gorillas. Climbing structures, grassy hills, ladders to upper levels, various sized tree limbs and cargo nets have been added each spring to provide new environmental challenges for the season.

On a daily basis the animals are given the opportunity to forage for their diets by having the food cut up in varying sizes, and scattered and hidden throughout the exhibit. Along with the fruits and vegetables, parrot mix, monkey biscuits, dry cereals, nuts and dried fruit bits are also scattered. Several of the large logs in the yard are drilled with different sized holes and a portion of their diet as well as peanut butter, yogurt and "special" treats are stuffed down into these holes. Most of these holes are too small for adult gorilla fingers. This gives youngsters an opportunity to get some goodies. Larger animals must spend more time manipulating the log and using sticks to work the food item out of the hole - thus "tool using". Large Boomer Balls®, PVC pipe, and pieces of .61m x 1.2m (2' x 4') with holes also provide a time consuming challenge getting out seeds and favorite foods.

Gorillas are known not to be particularly fond of water, however, not even the most finicky great ape can resist a run through a sprinkler or mister on a hot afternoon. Frozen fruit juices called "gorilla pops" and large blocks of ice are real crowd pleasers for both the animals and the visitors.

Since gorillas seem to believe the old adage "the grass is greener on the other side of the fence" and often want what is planted outside of their exhibit, a variety of herbs and edible plants are planted within a gorilla's arm's reach. Not only are these a tasty treat they can also be self medicating.

Animal Enrichment at the Columbus Zoo, Continued

The inside enclosures present a different set of challenges for both the keepers and the animals. There is no public viewing into the bedroom quarters, and being a northern zoo a good portion of the cold winter months are spent indoors. Heavy plastic flaps were placed on outside chute doors allowing individuals or groups to come and go outside without letting heat out of the building. During the winter, the building temperature is turned down so the animals will remain more active and become more accustomed to the cooler temperatures when they choose to wander outside. Bedding is added on a daily basis and the type of bedding used is rotated. It is not unusual to have bedding three to four feet deep in some areas and night nests deep enough that keepers occasionally have to look twice to find the silverback. The same forage foods that are placed in the outside yards during the summer are now scattered in the inside areas. Also, the PVC pipe feeders and drilled 2' x 4's are used. Cardboard boxes and yellow-pages phone books are provided to give opportunities just to tear something up.

The bedroom quarters measure approximately 3.048m x 7.62m (10' x 25') with block walls at the back and half way between each enclosure. The rest of the enclosure is 5.08cm x 5.08cm (2" x 2") interwoven mesh. This mesh allows for a variety of enrichment activities. Whole food items are thrown on top of the enclosures encouraging animals to spend time manipulating the item while hanging or standing in awkward positions. Tubs of monkey biscuits and seeds can be set on top, scattering them into the hay when poked at from below.

Outside each enclosure is a wooden stand with three holes large enough to hold 16-ounce cups. These cups may contain honey, yogurt, catsup, baby foods, and dry Kool-Aid®. Keepers provide branches, which each animal modifies and dips into the cups on the treat stand.

In the front aisle while classical music is played the family groups have a 25-gallon aquarium with gold fish for both listening and visual stimulus.

The back and side aisles have block walls to allow back aisle viewing without interrupting behaviors. An occasional block was removed and a mesh frame inserted. This also permits an additional level for seeds and treats to be placed, again making it time consuming to retrieve the items.

Instead of ropes hanging inside the enclosures, 7.62cm (3") fire hose, donated by local fire departments, is hung connecting both ends to the enclosure top, to make a comfortable swing for even the largest silverback. Each enclosure has a differently designed climbing structure and mesh beds at varying heights.

Enrichment For Large Cats

In the large cat area, enrichment has begun. To give the large carnivores activity and provide stimulus, large bones are hidden throughout the yard to be hunted as a time consuming activity. Catnip has been used with varying amounts of success with several of the large cats.

All cats have large logs in their areas either lying on the ground or hanging. These are used for sharpening their claws, rubbing, and as toys. The spotted leopards (*Panthera pardus*) and snow leopards (*Panthera unica*) have shown a particular interest in smaller logs which they can carry throughout the exhibit. Stumps with large root attachments are a challenge for the lions (*Panthera leo*), tigers (*Panthera t. tigris* and *Panthera tigris sumatrae*) and jaguars (*Panthera onca*). The Sumatran and Bengal tigers are provided with large pieces of PVC pipes sealed at both ends. The tigers practice their stalking and hunting skills when these prey items are thrown into their pool.

Boomer Balls® are also given as toys for the cats. However, we have had a leopard chip a canine tooth and several balls have been destroyed, causing some concern by our veterinary staff. A continued close-eye is suggested with any new item.

Other Enrichment Ideas

The black footed penguins (*Spheniscus demersus*) have shown an interest in dragging sticks and small branches around their enclosure. Plastic gallon jugs, a hula-hoop, and small PVC pipe were placed in their area with an almost immediate increase of activity.

Animal Enrichment at the Columbus Zoo, Continued

In the Children's Zoo, the Capuchin monkeys (*Cebus apella*) have a small log hanging with several holes drilled in it to retrieve their goodies.

The woolly monkeys (*Lagothrix lagotricha poeppigii*) are especially fond of their mealworm PVC pipe. Not only do they enjoy investigating it for insects, it is easy and fun to transport by their tail.

Keeping bonobos (*Pan paniscus*) occupied is always a challenge. By rotating a steady variety of browse and forage along with the Boomer Balls®, burlap bags and bedding, they continue to keep busy. Advance Drainage Systems, Inc. (3300 Riverside Drive, P.O. Box 218902, Columbus, Ohio, 43221), makers of heavy-duty polyethylene drainage pipes, has been very receptive to the idea of using their drainage pipes as enrichment items. They have gladly donated several different sized pipes to the zoo to be used for animal enrichment. As a thank you, we have sent them photos of the animals using the drainage pipe.

Brush piles and hanging browse are provided for hoofstock for eating and rubbing against.

In the pachyderm department, enrichment is given in several different ways. The primary purposes of elephant training is for enrichment as well as management. Above the black rhino (*Diceros bicornis*) pen a large plastic barrel is suspended. This permits the rhino to charge the barrel and use his horn to crash against it. Mud baths are provided for both the black and white rhinoceros (*Ceratotherium simum*), warthogs (*P. aethiopicus*), Baird's tapirs (*T. bairdii*) and African elephants (*Loxodonta africana*). These mud baths serve a tri-fold purpose of husbandry, skin care, and stimulus. Peat moss is provided to the black rhinos, warthogs, Baird's tapir and both the African and Asian elephants (*Elephas maximus*). One of the advantages of peat moss is that it can be used indoors as well as out.

The keepers in the bear department have reported a great activity response when the polar bears (*U. maritimus*) were given live carp or trout. The second most popular item was fruit frozen into large blocks of ice. Grizzlies (*U. arctos*) and black bears (*U. americanus*) forage for hours when raisins and peanuts are scattered throughout their yard.

A variety of browse is provided on a daily basis to all animals for eating, skin care, olfactory stimulus, and foraging.

Conclusion

Before it was given a title many keepers made enrichment a daily part of their job. Now we have the opportunity to develop new techniques and to share the information of what works and what does not with our fellow caregivers through Animal Keepers' Forum and The Shape of Enrichment newsletter. A first time ever enrichment conference was held in 1993 and hosted by the Metro Washington Park Zoo, Portland, OR. It was deemed an overwhelming success and it was unanimously agreed that these constructive workshops must continue.

Enrichment items discussed here are just the "tip of the iceberg". With the development of an enrichment committee and the support and encouragement of zoo management and veterinary staff, as well as the keepers, the Columbus Zoo has made the enrichment commitment.

Acknowledgment

We would like to thank the Columbus Zoo keepers in all the animal departments for sharing their information. Thanks also to the Docents, Maintenance and Horticulture departments for their hard work and interest, and the Management and Veterinary staff for their support.

Product mentioned in the text:

Boomer Balls, P.O. Box 83, Grayslake, IL, 60030

Reprinted from the 1993 AAZK Conference Proceedings, Atlanta, GA.



Overcoming Spatial Constraints Using Enrichment in the Exhibition of Small Mammals at the Philadelphia Zoo

By
Todd Sinander, Small Mammal Keeper
Philadelphia Zoo, Philadelphia, PA

Small mammal exhibits built before modern times were designed to give the public the best and closest possible view of the animals, without much regard for their physical, psychological and social needs. To make the animals more visible, the exhibits tended to be small and shallow. Modern day keepers who inherit these exhibits are challenged to satisfy the needs of the animals and, at the same time, maintain the visibility of those animals to the public. Environmental and behavioral enrichment through exhibit design and animal husbandry is the key to this challenge.

The Philadelphia Zoo's Small Mammal House contains a series of box-like exhibits that are behind glass and lined up, one after another, on both walls of an L-shaped hallway. The majority of the exhibits are shallow, approximately 90 cm (2' 11") deep range from 140-275 cm (4' 7" - 9') long and are between 70-160cm (2' 4" - 5' 3") high. The floor of each exhibit is 100 cm (3' 3") above the floor of the hallway. There is little to no off-exhibit space for each enclosure and all lighting is artificial. In a number of the exhibits, fiberglass rockwork was added, although the majority serves as aesthetics for the public rather than functional exhibit topography for the animals. Substrate and other topography are added to each exhibit by the keepers.

One of the most difficult groups to display in small exhibits are the mustelids. Captive mustelids are prone to hyperactivity, often expressed through bouts of stereotypic pacing. A single male ermine (*Mustela erminea*) is displayed in the Philadelphia Zoo's Small Mammal House. At first glance, the ermine's exhibit seemed suitable for an animal his size, even though it was essentially a 59 x 33 x 48 cm (1' 11" x 1' 1" x 1' 7") ventilated box pushed up against glass. The substrate was 20-25 cm (8-10") of soil which the ermine could dig into. For climbing and nesting, there was a small pile of rocks in the right back corner, a hollow log and a stump in the back left corner, and a branch that stretched from the lower left front to the upper right back of the exhibit. There was also a large tub of water in the center, against the back wall, where the ermine could cool off if he wanted to. Upon further inspection though, one could not help but notice the streaks of mud on the window where the ermine paced back and forth. Why then, with what seemed to be a well suited exhibit, was the ermine pacing?

One theory was that stress from the public being so close to the ermine may have been causing him to pace. That was discarded after many observations of the ermine sleeping soundly next to the glass with people banging on it one day, and later, observing him pace when the building was completely empty. Two other theories seemed more likely. The first is based on the behavior of the ermine in the wild. Ermine spend a great deal of time and energy searching for food. Although their high metabolism gives them a lot of energy to use, they are barely able to find enough food to maintain that energy level. So when an ermine has more than enough food and is living in a confined space, it may be that it burns off excess energy by pacing. The second theory is based on the fact that the ermine was fed once a day between 1100 and 1200 hours. Most of the pacing occurred between 0800 and 1230 hours, suggesting that the ermine may be pacing in anticipation of getting fed.

Unfortunately, I have lots of other small mammals to take care of, so I decided to throw the scientific method out the window and immediately implement enrichment that focused on both theories. To deal with the problem of the ermine needing to release excess energy normally used in foraging, I looked at ways in which I could divert that energy into something other than pacing. The ermine usually paced next to the glass where there was a straight and easy path. If the exhibit was so complicated that there was no easy pathway through it, he may work harder and expend more energy to get around it. To achieve this I stuffed small grape vines around and on top of the existing furniture. Initially, the ermine tried very hard to pace. I continued stuffing vine into places he found

Overcoming Spatial Constraints Using Enrichment, Continued

open enough to pace. After a few days he wasn't stereotypically pacing; but now his movement more resembled that of a gas molecule inside a small container, constantly bounding off every wall of the exhibit. I needed to divert more of his energy to other activities, so I concentrated on the way I presented his diet to him.

Each day the ermine received 1 mouse, 30 grams (1.1 oz.) of ground beef and 14 grams (0.5 oz.) of carnivore pellets mixed into the beef. On Sundays, along with his normal diet, the ermine received a rib bone. I wanted to make the ermine expend more energy getting his food, as ermine do in the wild. The mouse was his favorite so I started with that. I tied the mouse between two pieces of celery and then tied that to the ceiling of the exhibit with a short piece of string. The ermine had to balance himself on a branch and, at the same time, try to chew through the celery. On some occasions I've observed him working on the celery for up to a half an hour. Another way of presenting the mouse was to put it into a small cardboard box (used to send mealworms through the mail). The box contained several 2 cm (1") holes on each side. The ermine learned to get the mouse by bumping the box up and making the mouse fall next to one of the holes where he could grab it. To make it harder, I tied the mouse to a stick before putting it into the box. The ermine couldn't pull the mouse through, but had to eat it in small pieces through the box. Then he learned that he could chew the cardboard holes bigger and easily pull the stick and the mouse out. The box enrichment is still evolving.

Previously, the ground beef was fed in one piece on a dish. I started taking small, bite-sized pieces of meat and sticking them to branches throughout the exhibit. Instead of eating some meat and then caching the rest, the ermine had to search for it, and then usually eating all that was given to him. The rib that was given to the ermine once a week was also normally placed on a dish in his exhibit. The rib would disappear for a few days and then show up half eaten. I started to tie the rib to a branch with a string a few inches long. The ermine became very determined to get the rib down, expending lots of energy in the process. I also used a block of ice when presenting food to the ermine. Instead of freezing the beef into the ice, which he didn't respond to, I smeared it onto the surface where it readily stuck. It took him quite awhile to work the meat off the ice.

At the same time that I was making the ermine work harder, I altered his feeding schedule so that he could not anticipate when any part of his diet would be fed to him. His diet was fed as described above in small portions, at least four or five times per day and never at the same time two days in a row.

After two weeks of this enrichment program, the ermine displayed no stereotypic pacing during the daytime hours and his hyperactivity seemed to decrease. I can't say for sure whether or not he was pacing during the night, but I didn't see any of the common signs of it in the exhibit. His visibility did decrease a bit initially, probably due to sleeping more in out of the sight locations. After modifying his exhibit to include visible nesting areas, such as a hollow log that was cut in half and pushed up against the glass, he spent more time sleeping in public view.

From working with the ermine I learned a great deal about what I could do to improve an animal's life in these small exhibits and, in turn, make the animals more viewable to the public. I started to apply these same principles to other exhibits in the building.

I received two sibling male dwarf mongoose (*Helogale parvula*) from an exhibit in another part of the zoo. The two were fighting with each other and with their parents. It was thought that if the two brothers were separated from the parents, the fighting might stop. They were to be moved into an exhibit in the small Mammal House that was originally designed for prairie dogs (*Cynomys ludovicianus*).

The exhibit is composed of two sections. The primary exhibit space is a 163 x 91 x 157 cm (5' 4" x 3" x 5' 2") area with a small fiberglass prairie dog mound on the right side of the floor. The left wall and most of the back wall has an eroded embankment that goes about two thirds of the way up the wall and is also made from fiberglass. A short passageway into the embankment and out of view of the public, connects a second exhibit which is to the left of the primary exhibit. The second exhibit is a 7ft.-long cross section of an almost vertical fiberglass tunnel that is pressed up against glass. The top of the tunnel, which is shaped like another prairie dog mound, leads to a 76 x 60 x 60 cm (2' 6" x 2' x 2') open space. From this point to the floor of the public hallway is about 2.5 meters (8' 2").

Overcoming Spatial Constraints Using Enrichment, Continued

To give the mongoose places to hide from the public, a 40 cm (16") high pile of medium sized rocks was added on the right side of the exhibit, over the fiberglass prairie dog mound. I leaned several branches against the pile of rocks and across the front of the exhibit. I also added branches to the top of the second exhibit. I used 3-5 cm (1-2") of sand for a substrate on the floor of each exhibit.

The first few weeks after the mongoose were put into the exhibit they seemed to be doing well. They utilized all parts of the exhibit, including the long vertical tunnel. They would occasionally run and hide if someone from the public banged on the glass, but generally seemed to ignore the public. Then signs of tension between the two began to emerge, especially around mid-morning when they were fed. Squabbles occurred more frequently and lasted longer. A short time later, a keeper found both animals viciously attacking each other. The mongoose were immediately separated and removed from the exhibit.

After the medical concerns were over, the question was what to do with the mongoose now? Dwarf mongoose are highly social animals and do not do well by themselves. They are also fairly common in zoos and single males are difficult to place. Our off-exhibit holding was inadequate for mongoose, so the only option we had was to try them in the exhibit one more time. This time, however, the exhibit design and the general husbandry was going to get an overhaul.

Tension between two highly social animals can be caused by a number of different factors. I focused on two that seemed to be the most likely. One was, again, the problem of too little space in the exhibit. The animals might not have been able to get far enough away from each other or the public. The other was competition for food. The dominant mongoose was very protective of the food when it was first placed into the exhibit.

For the problem of space, I looked at the way I originally designed the primary exhibit. The mongoose had the small rock pile that they were able to hide inside. It took up about half of the exhibit floor space, but only used one fifth of the exhibit's vertical space. The only way to increase the usable space for the mongoose was to make the exhibit more complicated by utilizing the height of the exhibit. So I used the top of the fiberglass embankment, which the mongoose couldn't get onto before, to support a large log that stretched across the primary exhibit. I then used that to support a hollow log and several branches throughout the entire exhibit.

The problem of the mongoose competing for the food was difficult. Their daily diet consisted of 1 mouse each, ZUPREEM® canned feline diet, a mix of chopped fruits and vegetables, and live insects. The only access into the exhibit was through the glass viewing door on the public side. Feeding more than once a day while the building was open would have been problematic. Feeding in two separate places was considered, but because there wasn't enough floor space in the exhibit, it wasn't practical. What I decided to do was to overfeed the mongoose just enough that there would always be some food left in the exhibit the next day. In addition, the amount of live insects that the mongoose received would be increased. When foraging for live insects, which was one of their preferred foods, the mongoose concentrated on the insects while generally ignoring each other.

The mongoose were reintroduced in an off-exhibit holding area and then returned to their remodeled exhibit. Their behavior over the next few weeks seemed calm. Occasionally, I did notice some signs of tension between the two mongoose. I would then put some crickets, or a fresh branch into the exhibit and this would usually distract them enough to defuse the tension. I started to rotate branches in and out of the exhibit every other day and move branches around in the exhibit daily. The mongoose would sniff and mark the new branches several times throughout the day, which may have helped keep tension down. As time passed, the mongoose settled down and I rarely saw any signs of tension. I eventually reduced their diet back down to its normal amount and, so far, the mongoose are getting along fine.

These are just two examples of how enrichment, in both exhibit design and in animal husbandry, is an important component of successfully exhibiting small mammals in a limited space. The environment for both large and small mammals can be diverse and complicated. But, unlike their counterparts, small mammal habitat in the wild isn't a forest or a grassy plain, it's a tree's exposed root system or a burrow under a clump of

Overcoming Spatial Constraints Using Enrichment, Continued

grass. Using environmental and behavioral enrichment, an exhibit with limited space can be made suitable for the animals within and educational to the viewing public. Unfortunately, the amount of time needed to maintain the high level of enrichment these exhibits require often becomes too much for the keeper. As soon as I fell behind on some of the enrichment for the ermine, I had to start cleaning the mud off of the glass again.



Book Reviews

Stereotypic Animal Behaviour: Fundamentals and Applications to Welfare

Edited by Alistair B. Lawrence and Jeffrey Rushen - 1993

CAB International, Wallingford, Oxon OX10 8DE, UK

Hardcover, 212 pgs - \$45.00

Available through Goldberg Book Distributors

45 Belvidere St., Nazareth, PA 18064

Phone: (610) 759-9458 FAX: (610) 759-8134

*Review by Gregory C. McKinney
Keeper, Zoological Society
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Philadelphia, PA*

In contrast to the sterile tiles and bars of the past, zoos today often take much care, when designing and building a new exhibit, to portray its inhabitants in as true to life surroundings as possible. But it is not enough to present a captive animal with a setting similar to its native environment. Naturalistic habitats may be aesthetically beautiful (at least to our eyes) but alone they may not be psychologically rewarding to the animal caged within. Without a certain amount of variability and complexity, these animals are likely to be nearly as frustrated with their captivity as their ancestors were before them.

A growing number of animal workers are concerned with providing behavioral enrichment opportunities for their animals. Providing novel objects, however simple or complex, does help elicit exploratory, play, or even breeding behavior. Likewise, scattering feedings throughout the day, varying diets, and making food less accessible can help ease the boredom and frustration that must be a part of living a captive life. A great amount of research is confirming what zookeepers already know - that these efforts can help prevent stereotypies from developing or help to diminish those that already have.

Stereotypic Animal Behaviour is composed of eight essays written or co-written by 14 researchers. It provides a synthesis of recent work from several different perspectives. All essays will not be of equal interest to the reader--authors include neurobiologists and pharmacologists as well as ethologists--but each one should provide information for the person who wishes to challenge what may be a prevailing view of what is necessary for an animals' well-being. Several of the essayists provide suggestions for further research studies. Each essay ends with pages of references which is great for the person who desires more information on a specific topic.

Stereotypies have been defined as "unvarying, repetitive behaviour patterns that have no obvious goal or function." (p. 8). Defining a behavior as stereotypic is largely a subjective process and the most problematical characteristic to define is that of lack of function. For instance, it is believed that at least some of these patterns develop to compensate for absent sources of stimulation and thus, strictly speaking, do serve a function. I have heard the claim that stereotypies not only serve a function but that they can be adequate beneficial coping strategies. In response, Francoise Wemelsfelder writes, in the essay that is probably the most applicable to zookeeping: The Concept of Animal Boredom and its

Book Review, Continued

Relationship to Stereotyped Behaviour - "to say that stereotypes 'help' the animal to cope evokes the unfounded suggestion that stereotypes are continuous with normal forms of behavioural control and generally do not affect welfare." (p.78). And that these coping strategies or behavioral fixations "...signify the impairment, rather than the facilitation of attention." (p. 80). I do believe that there is a clear distinction between an act done to achieve a goal and an act done because such a goal is unachievable; and rather than get stuck on a question of semantics (as is so often the case in studying animal behavior and welfare) we should consider stereotypes as potentially harmful, inappropriate behaviors which often develop from lack of proper care and which express a certain amount of frustration and even suffering.

Findings are presented from studies which have attempted to measure changes which occur within an organism that is exhibiting stereotypes. None of these findings reinforce the suggestion that stereotypes are coping strategies. Not surprisingly, these essays conclude in much the same way--not enough data, more research needs to be done. Unfortunately, most of the researchers seem to place little value on observational studies and instead place the most emphasis on research which will investigate changes in an animal performing stereotypes induced by stress or drugs. However, there is information here that will be of great interest to many. For instance, Simona Cabib, while investigating the brain's mesoaccumbens dopamine system in adaptation to stress, writes of "a virtual absence of classical amphetamine-induced stereotypes in animals tested in a novel environment. This result suggests that some brain areas concerned with novelty processing exert an inhibitory action on stereotypes." (p. 124). Score one huge point for environmental enrichment.

It should be pointed out, I think, that the vast majority of animal subjects used in the research referred to in the book are not primates, which receive the most concern regarding behavioral enrichment, but are cattle, horses, sheep, goats, pigs, cats, and, of course, rats and mice. It would seem to me that wild or exotic animals would be in at least as much need of variety as domestics.

As of this time Stereotypic Animal Behaviour has not been printed in the U.S. and it may be hard to find, but I feel it would be well worth purchasing to make part of any animal institution's library. This book does not present remedies to reverse stereotypes, nor does it suggest ways in which to enrich a particular species' or individual's environment to prevent them from developing. It does, however, present research from different fields which suggests that these behaviors are not simple coping strategies and that there is enough known to prevent many from occurring.



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1995 AAZK National Conference Denver, Colorado September 24-28, 1995



SECOND CALL FOR PAPERS

Plan now to share your knowledge with your fellow keepers. This year's topic is "Habitat Destruction, Creation and Conservation - in Captivity and the Wild". **DEADLINE for submissions is 1 July 1995.** Papers, poster sessions and workshops are invited.

- Papers will be limited to 15 minutes followed by 5 minutes of questions.
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Please submit a short abstract for all proposed papers, poster sessions or workshops. Abstracts should include the name of presenter, presenter's job title, zoo affiliation, title of paper, proposed format (paper, workshop or poster), and equipment needed for presentation (slide projector, VCR, overhead projector, etc.)

Send abstracts to:
Todd Cleveland, 1995 AAZK Conference
Denver Zoo, City Park
Denver, CO 80205-4899

Average Weather for the Conference and for Pre- and Post-Conference Trips: Clothing Suggestions

Bring plenty of warm clothes, comfy warm socks and hiking boots would be ideal. **DON'T FORGET THAT SUNSCREEN.** At high altitudes the sun is intense! (SPF 20 or higher is recommended.) It is not uncommon for it to snow in September in the mountains. If the weather is nice, expect 60s during the day and frost at night. Gloves, hat and thermal underwear may be helpful. Plan for the cold. Dress in layers, so you can change as the weather changes. **BE PREPARED!**

Average weather for Denver in September is around 75°F with 47°F average for the evenings. Very unpredictable. This is our transition month. It has been known to snow as early as September 3rd. If you don't like the weather wait a few minutes, it can change at any time. It always seems to cloud up in the afternoon then clears again about 5 p.m. **DON'T FOR GET THAT SUNSCREEN** (SPF 15 or higher is recommended). Clothes to bring should include: shorts and T-shirts, sweatshirt or sweaters and long pants. Also include a warm coat, hat and gloves.

Denver's altitude is 5280 ft. With that high altitude comes adjustments for your body. Some signs of high altitude illness are headaches, nausea, shortness of breath, and fatigue. Allow your body to acclimate to the altitude, especially in the first 24-48 hours. Drink plenty of fluids, eat a light diet, and choose mild activity. **CAUTION** - Alcohol will affect you more quickly.

Additional Conference Notes

- ☐ Exhibit tables are still available. They are 6 ft. long. Cost is \$15.00 for half a table; \$30.00 for a whole table. Deadline for reserving a space is **15 August 1995.** NOTE: The room will be locked each evening--security provided.
- ☐ There will be a VCR available in the Hospitality Suite. Please bring an entertaining or educational video or a video of your zoo. Past conference videos are also of interest.
- ☐ The Executive Towers is located in central downtown Denver. It's just a short bus ride away from the zoo. It is within walking distance of shopping, micro breweries, restaurants and night clubs. Public transportation is easily accessible.
- ☐ Post-Conference is to Estes Park. Guests will be staying in log cabins located near the river. Amenities include washer/dryer, kitchenette, indoor plumbing, and a hot tub. Bring your swimsuit!

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

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Zip/Postal Code_____Phone (____)_____

Zoo Affiliation_____Position/Title_____

AAZK Chapter_____AAZK Membership Status_____

Number of AAZK Conferences you have attended_____

AAZK Committee Member?_____

Presenting a Paper/Poster? (please circle) Yes_____No_____

Title_____

Participating in Zoolympics? Yes_____No_____

Bringing an Auction Item? Yes_____No_____

Optional Activities: (extra charges involved)

Need table in Exhibitors Hall? Yes_____No_____

Casino Trip on Monday night Yes_____No_____

Pre-Conference Trip A Yes_____No_____

Pre-Conference Trip B Yes_____No_____

Post-Conference Trip Yes_____No_____

Horseback riding on Post-Conf. Trip Yes_____No_____

Vegetarian? Yes_____No_____What type?_____

T-Shirt? Yes_____No_____Size (L, XL)_____

Arrival Date and Time_____

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

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AAZK Member	\$100.00*	_____
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Daily Fee (which day) _____ (See Day Rates Schedule on next page)		_____
Pre-Conference Trip A	\$ 20.00	_____
Pre-Conference Trip B	\$ 35.00	_____
Post-Conference Trip	\$150.00	_____
Horseback Riding on Post-Conf. Trip	\$ 30.00	_____
Late Fee (after August 1, 1995) (only for full conference, not for individual days; no reservations for Pre- or Post-Conference trips accepted after August 1.)	\$ 10.00	_____
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*Fee includes a \$20.00 contribution to AAZK National.

*Fee does not include cost of Conference Proceedings.

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1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

For those individuals who will not be attending the entire conference, the following rates show the cost of daily registration or single events. These rates apply **ONLY** to those individuals who do not pay the full registration fee. If you have registered and paid for the full conference, all events listed below are included in that fee. (Excepted is the optional Casino trip, which is an extra charge for full conference attendees.)

Sunday, September 24

Cost: \$26.00

Open Board meeting

Committee meetings

Evening Event: Icebreaker at the Denver Museum of Natural History

Monday, September 25

Cost: \$21.00

Paper sessions

Workshops

AM Break and Lunch

Cost: \$10.00

Evening Event (optional): Casino Night in Central City. Includes buffet dinner, 2 drinks, \$2.00 coupon for use in casino gift shop, ice cream cone and two Royal dollars at the Blackjack Table Match Play.

Tuesday, September 26

Cost: \$21.50

Day at the Denver Zoo. Includes behind-the-scenes tours, workshops, lunch, Zoolympics and dinner.

Wednesday, September 27

Cost: \$30.00

Paper sessions

Workshops

AM Break and Awards Luncheon

Tour of Rocky Mountain Arsenal Wildlife Refuge

Evening Event: Silent Auction

Thursday, September 28

Cost: \$38.50

Paper sessions

Workshops

AM Break

Tour of Rocky Mountain Arsenal Wildlife Refuge

Evening Event: Final Banquet

United Airlines has been chosen as the Official Carrier for the 1995 AAZK National Conference. For further information on fares in the U.S. and Canada, call 1-800-521-4041. Use reference #590XM.

Feeding Barrel for Giraffe (*Giraffa camelopardalis*) at the Columbus Zoo

By
Frederick A. Nicklaus and Troy A. Mueller
Herbivore/Carnivore Keepers
Columbus Zoo, Powell, Ohio

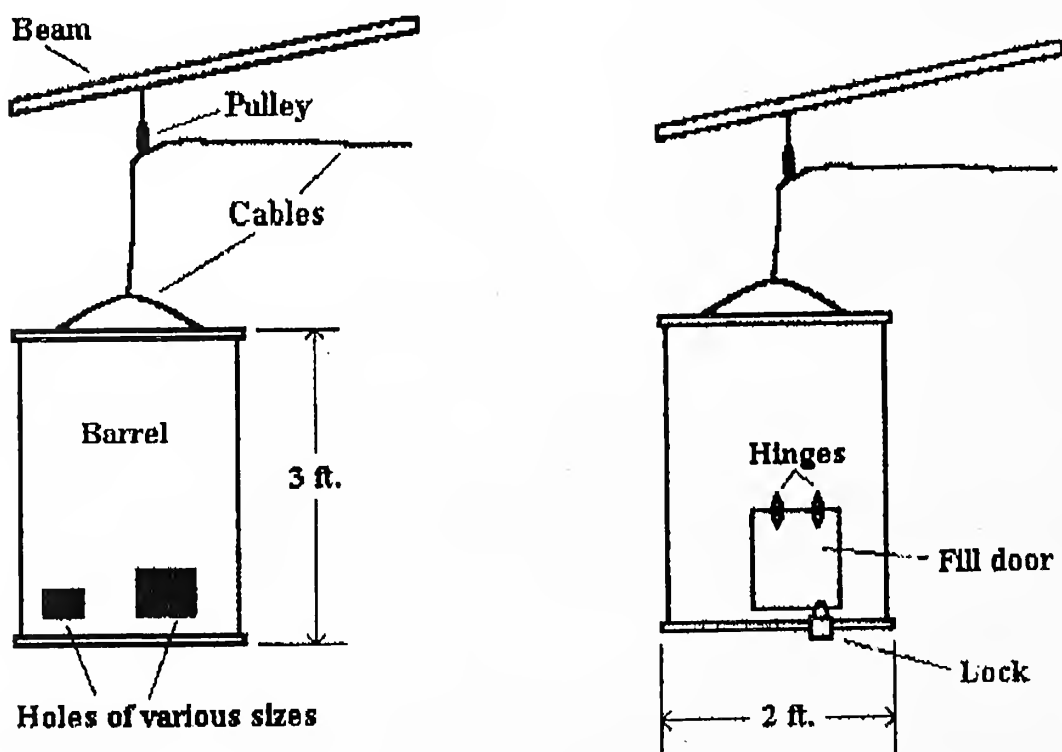
Background

The 1.2 Reticulated giraffes (*Giraffa camelopardalis*) on display at the Columbus Zoo range in ages from two to five years. They are housed in the Herbivore/Carnivore complex where, during the winter months, they remain in an indoor area consisting of five stalls, each measuring approximately 6m x 9m (20' x 30'). Between each of these stalls are gates that, when opened, turn the five stalls into one large stall. During the five months that they are kept inside, stereotypical behaviors, such as licking the outer concrete walls, pacing, and rubbing their necks against the chainlink gates, have been observed. Realizing that giraffes have very agile tongues, it was decided to create and construct a simplistic puzzle-feeder in which they could manipulate food items, thus reducing the time spent on stereotypic behaviors.

Materials and Methods

A sanitation plastic barrel was acquired, in which squares of various sizes were cut out of the sides. A large door was then cut out and refastened to the barrel with hinges so that the food items could be easily placed inside. After filing down the sharp edges around each hole, the barrel was hung from a cable through a pulley system so that it could be raised and lowered to various heights. This made it easy for keepers to fill and clean the barrel and to also keep it out of the giraffes' reach during the night. (see Figure 1)

Figure 1

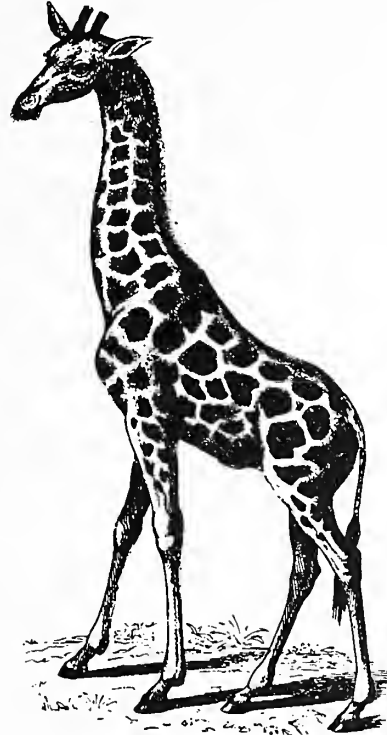


Feeding Barrel for Giraffe. *Continued*

The barrel was initially placed in an empty adjacent pen with hay on top of it which encouraged the giraffes to investigate. After several days, keepers filled the barrel with hay and hung it up in the pen to which the giraffe had access. At first the giraffes were wary of it, but after about two days they gained the courage to approach it and find the hay. Once all the hay is eaten, the male uses it as a toy, banging it around with his head for the remainder of the day. The giraffes are only given the opportunity to use the barrel a few times per week so that it does not become too routine for them.

Conclusion

Since the barrel was employed, the giraffes spend a considerable amount of time feeding from it. They approach it as soon as it is lowered and will sometimes even come back later in the afternoon to check it for more hay. It is believed that this feeder is a success in reducing the time spent on stereotypical behaviors and future plans have been made to construct other barrels of this type. It is hoped that this idea can be expanded upon to create a more stimulating environment for these animals while they are kept inside during the winter months.



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\$14.95	\$12.00	<u>Discovering Nature at Sundown</u> - Things to Know and that become active at sundown. 224 pgs. Paper
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Chapter News

Greater Houston Area Chapter

Our planning for Bowling for Rhinos is well underway. We are planning to have the event in August. We are very excited that Subway is thinking of sponsoring the event.

Our Chapter is taking a fieldtrip to The Houston Museum of Natural Sciences. We are trying to have a trip every other month. Everyone is very excited about going. The museum is providing us with a behind-the-scenes tour of the Butterfly Exhibit.

The Chapter also agreed to financially support the Zoo Enrichment Group. The Group just finished enrichment items for the Bird Department and the Children's Zoo. They are now working on items for Small Mammals, Reptiles, and Primates.

--Sheri Leavitt, Secretary

Tucson Chapter AAZK

Newly elected officers for the Tucson Chapter of AAZK, which includes members from Reid Park Zoo and the Arizona-Sonora Desert Museum, are:

President.....Michelle Acuña
Vice President.....Taylor Edwards
Secretary.....Mara Gonzalez
Treasurer.....Dee Nelson
Chapter Liaison.....Stacy Palm

In March, the Chapter had as a guest speaker Irene Pepperberg, University of Arizona Associate Professor in the Department of Ecology and Evolutionary Biology. She gave a talk about her African Grey Parrot "Alex" and her ongoing communication research. The Chapter held a raffle and donated \$50.00 to the Alex Foundation.

--Stacy Palm, Chapter Liaison

Puget Sound Chapter (Seattle, WA)

The Puget Sound Chapter ended 1994 with our Third Annual Silent Auction. The auction is our main fundraising event which enables us to complete our projects and goals for 1995. The year end also brought the election of the following officers:

President.....Tina Mullett
Vice President.....Carol Simkins
Secretary.....Russ Roach
Treasurer.....Roz Sealy
Zoo Society Liaison...Harmony Frazier
Chapter Liaison.....Dianne Abbey

The Chapter donated \$1,000.00 in memory of former Woodland Park Zoo keeper Jack Simmons to Dr. Melody E. Roelke-Parker. The money donated will be used in her research lab in Seronera in developing a distemper vaccine for lions.

We also allocated \$300.00 to help purchase guide books for the Nambi Preserve in Columbia. the books are in Spanish and are geared for secondary school students. The books will be loaned to local schools as well as be available at the Preserve for use by school groups and other visitors.

In March we held a used book sale at the Zoo. The event was a huge success with a net profit of \$1,825.00. The book sale was coordinated by Chapter members Judie Steenberg and Allison Barr with several other members and volunteers assisting. The money raised went to the **Tree Kangaroo SSP Avian T.B. Research Project**. This project's goal is to develop a vaccine to protect Tree Kangaroos from contracting avian tuberculosis. A special thanks to member James Scott who pre-sorted hundreds of books!

The Chapter looks forward to a busy summer and assisting the zoo with the 1995 AZA Conference which will be held in Seattle this September.

--Tina Mullett, President

Chapter News, Continued

Western New York AAZK Chapter

Our Chapter was very excited to host a presentation by Andy Lodge of the Ngare Sergoi Rhino Sanctuary during the month of October. He spoke about the disappearance of the rhino and of the Sanctuary's work. During his stay he spoke at the Zoo as well as several area schools.

His visit was sponsored by our Chapter as well as the Buffalo Zoo Docent Organization and the Niagara County Community College (NCCC) Zoo Crew. Approximately \$1000.00 was donated to the Sanctuary during Andy's visit. We would like to thank NCCC's Animal Management Supervisor Carol Riniolo for her efforts in bringing Andy to the Western New York area.

In June we participated in our Third Annual Bowling for Rhinos which took place at the Broadway Sports Center. Once again this was a very successful event raising almost \$1500.00 for the Ngare Sergoi Rhino Sanctuary. Each bowler was given a free T-shirt for participating and various prizes were awarded.

Our ESP Conservation Parking Meter has been very successful since we purchased it at the end of 1992. So far we have raised almost \$2,300.00. We would like to thank the docents for helping us to take care of the meter while it is in the World of Wildlife building at the main entrance.

Fundraising projects at the zoo include bake sales, recycling pop cans, and, in the future, candy sales. Money raised is used for donations to various organizations, to send members to conferences, and to purchase items to be used for enrichment. Thanks go to the MCCC's Zoo Crew for donating money to be used for enrichment.

In May, three of our Keepers - David Brigham, John Heine, and Kevin Murphy - took part in the New Jersey Audubon Society's World Series of Birding competition for the sixth year. The goal of the competition is to raise funds to purchase and protect habitat in New Jersey and to fund projects for

organizations that send people to the competition. The competitors must get sponsors to pledge a certain amount of money per species seen during the allotted time period. The "Bird Nerds" as they're known at the zoo, have improved their score with each year they've competed and raised almost \$2,500.00 in 1994 alone. We wish them luck in their next World Series of Birding.

Our officers for 1995 are:

President.....David Brigham
Vice President.....Aimée D'Angelo
Secretary.....Sherri Doherty
Treasurer.....Nancy Stengel

We look forward to a great 1995!

AAZK of the Pikes Peak Region

Pikes Peak Region AAZK (Cheyenne Mountain Zoo) has elected new officers for 1995. They are:

President.....Katie Wagner
Vice President.....Sandy Thompson
Treasurer.....Randy Barker
Secretary.....Kris Hassler
Liaison.....Stacey Paisner

We have started this year getting organized after a brief lapse in AAZK involvement within our chapter. We have several projects already online--the first being Earth Day celebration at the Zoo where we continued our annual bake sale fundraiser. In addition this year, we put together a packet of notecards featuring animal mothers and babies at CMZ to sell. Many thanks to keeper Heidi Gentner for providing the artwork!

Other projects we are working on are improving our recycling of aluminum and plastic, Bowling for Rhinos, and we are especially looking forward to hosting a National Conference Pre-Conference tour of our facility in September. You can look forward to lunch at the zoo, informative workshops and some great behind-the-scenes tours. We hope to see you here and also at the National Conference!

--Stacey Paisner, Liaison

Chapter News, Continued

Little Rock Chapter AAZK

During 1994, the Chapter helped sponsor eight keepers to educational conferences around the country including AAZK National, AAZK Southern and Central Regionals, Elephant Managers Association and the International Conference on Orangutans.

Our new officers were elected at our December, 1994 meeting which was followed by our holiday season party.

New officers are:

President.....Janet Meade-Cooper
Vice President.....Beth Paul
Treasurer.....Britt Thompson
Secretary.....Jan Taylor
Liaison.....Marie Greene

In January, the Chapter discussed our goals for the year and made suggestions on conservation works. In February we had our Ninth Annual Mexican Food Festival. Our guest speaker at this meeting was Mark Shaw, our new Education Coordinator. He spoke about his plans for the upcoming year and ways in which the Chapter can get more involved in education.

Our March meeting included keeper training videos and plans were made to show more at the zoo with all staff members being encouraged to attend.

Please note that our meeting date has changed to the first Thursday of every month.

--Jan Taylor, Secretary



Improving Zoo Enclosures

Most zoos throughout the world have a number of old enclosures which need improvement to meet the behavioral needs of the animals. The International Academy of Animal Welfare Sciences (IAAWS) - a subsidiary charity of Universities Federation for Animal Welfare (UFAW) - has produced a new leaflet which suggests practical ways in which old zoo enclosures can be improved for the immediate benefit of the animals with a minimum of expense. Often it would be better to build new enclosures, but it may not always be possible or affordable.


Inexpensive Ways of Improving Zoo Enclosures for Mammals by T.B. Poole and G. Law. With illustrations by R. Strachan. 6 pp. Published by UFAW 1995 on behalf of the International Academy of Animal Welfare Sciences. ISBN 0 900767 89 8. Price £1.00/US\$2.00 postage paid from UFAW. Order from UFAW, 8 Hamilton Close, South Mimms, Potters Bar, Herts, UK EN6 3QD.

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Zoo Infant Development Two-Volume Reference Set

*Edited by Harmony Frazier, LVT, Woodland Park Zoo, Seattle, WA and
Kathleen Hunt, B.A., Dept. of Zoology, University of Washington*



The American Association of Zoo Keepers, Inc. is pleased to announce the availability of an important reference work. This 1820-page, two volume set is a reference manual of the physical and behavioral development of parent-reared mammal infants in captive collections. These volumes include normal rearing information and weights for many species and can be quickly utilized for quick comparison and reference when deciding whether an infant is being properly cared for or is in need of intervention.

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To order, fill out the form below and return with your payment to: AAZK, Inc. ZIDP Notebook, 635 S.W. Gage Blvd., Topeka, KS 66606-2066 U.S.A. Checks or money orders should be made payable to "AAZK, Inc." (U.S. FUNDS ONLY). If using a credit card, make sure to complete all requested information on form. Prices are:

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*By Maria K. McManus, Keeper
Indianapolis Zoo, Indianapolis, Indiana*

Behavioral enrichment is a daily challenge for keepers. Developing new ideas on a regular basis is not easy and sometimes cases of enrichment block can occur. Receiving input from other staff members can help keepers get out of their own rut. The Indianapolis Zoo, recognizing the benefit of combined efforts on enrichment, formed the Behavioral Enrichment Committee in 1992. The committee consists of one keeper from every biome or area, a horticulture staff member, a hospital staff member and an education staff member. The group meets every two weeks to discuss the behavioral enrichment concerns of the zoo's collection. The variety of people in the group provides a broad idea base to work from. Keepers bring any behavioral concerns to the committee. When a project has been agreed upon, the committee and the staff from that biome work together to create a solution. The projects have ranged from birds to baboons and, of course, bears. The Indianapolis Zoo houses two Kodiak bears (*Ursus arctos middendorffi*) and four polar bears (*Ursus maritimus*). A staff member suggested that the committee look into finding some new enrichment options for the bears. Through viewing the exhibits, the committee developed several options which varied from the list of already in-practice enrichment ideas (List A). Most of the new ideas required exhibit renovation. These ideas ranged from creating new holes in the exhibits to hide food items, holes in the wall of the exhibit for the bears to go in, new tree props, a sand box, to pressure plates that would release sounds and food items. The next step was to review the suggestions and eliminate any options that were not feasible due to current exhibit design and funding.

The Kodiak bear exhibit (Fig. 1) was the one where renovation was seen as an option. With some modification, more tree props and a sand box were the options chosen. Due to the design of our waterfall's recirculation pumps, sand was not a suitable substrate for the sand box. The idea was then transformed into a substrate box which would contain mulch or leaf litter. In order to keep the naturalistic appearance of the exhibit, it was determined that the substrate box would be a substrate shape rather than a box. It would be created by framing an area with tree props. This modified plan was approved by keeper staff, collections management staff, maintenance and horticulture staff (Fig. 2). Once all approval was given, the hunt for the money was on.

The Behavioral Enrichment Committee was relatively new at this time and several departments had questions about its function. The chairman of the committee was asked to come to an education staff meeting to answer any questions they might have. During this meeting the need for funding was mentioned. Deb Buehler, an education staff member, mentioned she had a source for some money through a biology teacher in a local school. Each year, fifth and sixth grade biology students would raise money and give it to a special project in the zoo. With this information, the Behavioral Enrichment Committee gave education a list of three options to give the classes. A few days later they reported that the class had selected to fund the Kodiak bear project.

Teacher Wayne Sholtz raises this money every year through all his biology classes. The top two money raising classes earn a trip to the zoo, with the class raising the most money getting a special tour. Last year the money went to the elephant fund and they were given a behind-the-scenes tour. This year, since the money went for an enrichment project, they received more than a tour; the class received a behind-the-scenes tour of the bear exhibit where the bear routine was explained, then they were able to put all kinds of enrichment items on exhibit. They were given a Boomer Ball®, honey, peanut butter, bread, apples, bones, and dog chow to disperse around the exhibit. The keepers explained the benefits of enrichment, as well as some aspects of Kodiak bear behavior in both captivity and in the wild so they could better understand the importance of enrichment. The hope was that the students would not only have fun but learn about bear behavior. The class spent a half an hour watching the bears while the keepers talked to them about bears.

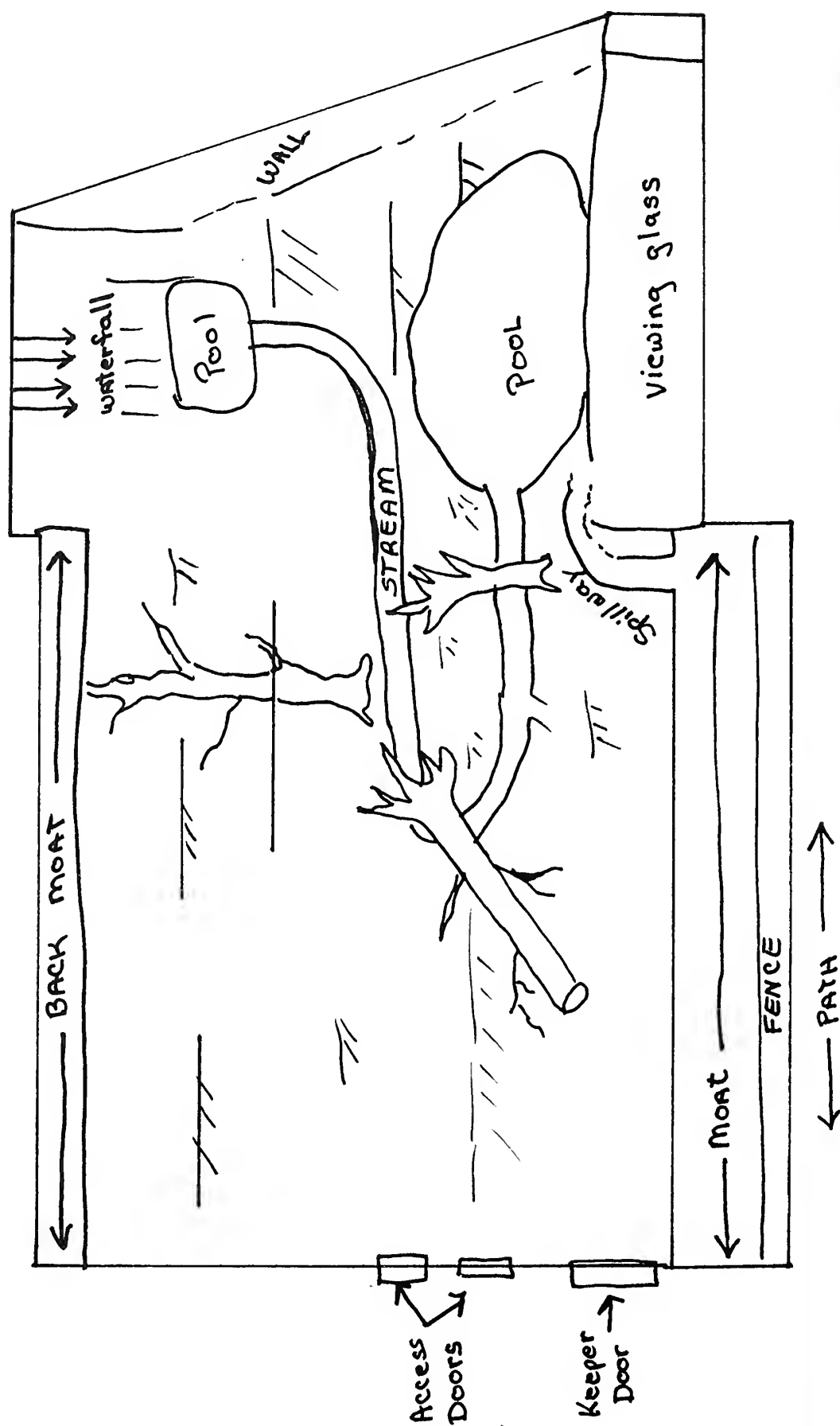


FIGURE 1: Original Kodiak Bear Exhibit

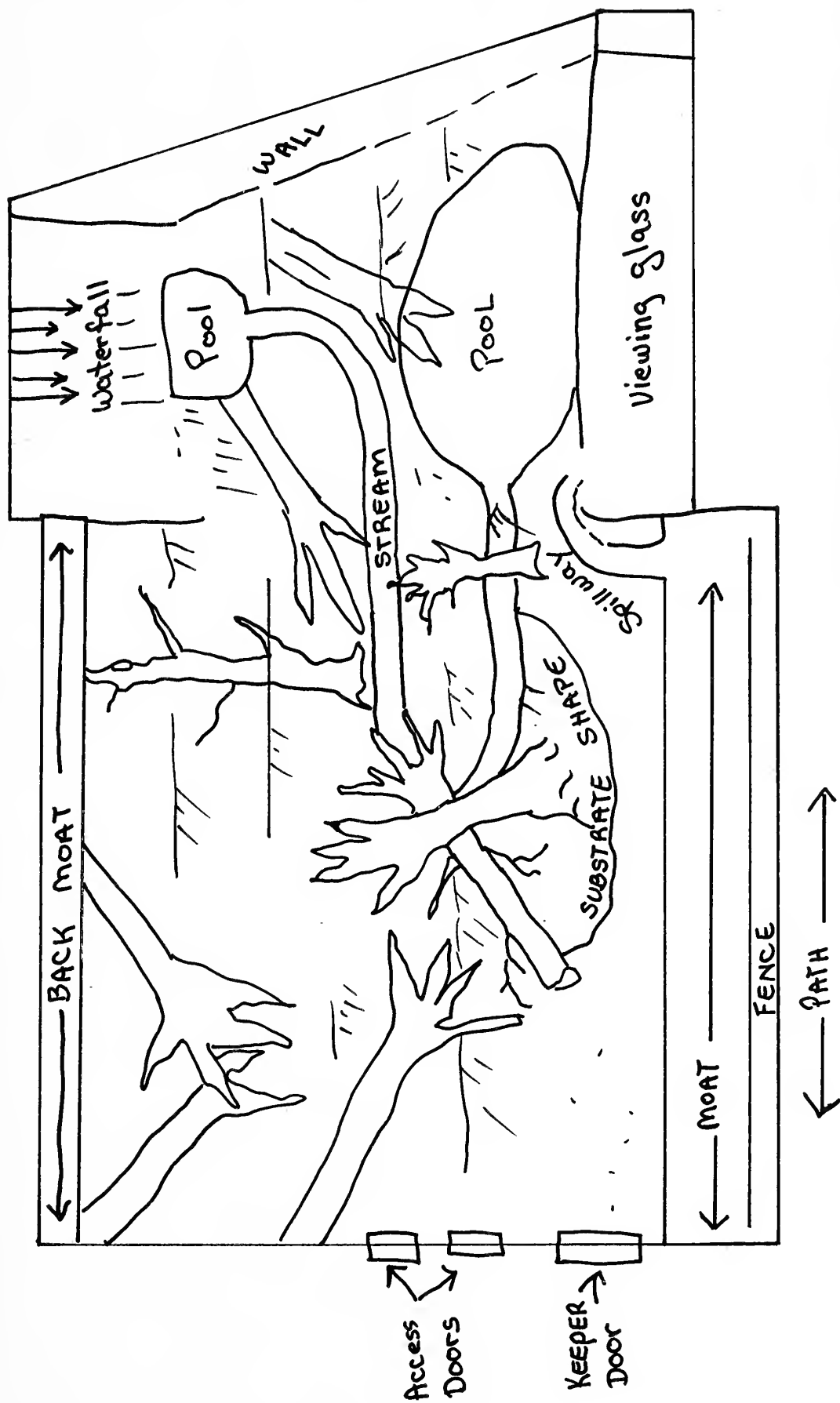


FIGURE 2: Renovation Plans for Kodiak Bear Exhibit

Kodiak Bear Exhibit Renovation, Continued

With money obtained and the class educated, the next step was finding trees. In order to complete renovation, we needed six to eight cedar trees to be used as lay down props. Cedar was the choice due to its strength and aesthetic value. A cedar tree looks most like what would be found in the Kodiak bear's natural habitat. That number of trees was needed in order to have enough to frame the substrate shape. A joint effort by the horticulture and keeper staff decided on the placement of the lay down props. The hope was to try to break up the pacing pattern which the bears had developed over their six years in the exhibit. The bears, Ahkiok and Chugach, were obtained by the Indianapolis Zoo in 1988 when the zoo was moved to its current location. The bears were sixteen months old at that time. They do not display much stereo typical behavior at all. The pacing they do practice is along the back wall where they can see into the parking lot. The behavior is only performed by the bears for about 1/3 of their day on exhibit and is primarily a seasonal behavior.

The keeper staff works hard to provide plenty to occupy the bears' time and to keep these activities varied. The exhibit renovation is another attempt to enrich their environment. The cedar trees which were needed were not easy to find. Horticulture called a tree company, Homeworks of Indianapolis, that after several months of searching finally gave up and said they could not find the appropriate trees. Then the search fell into the hands of the keepers who called on a farmer who had provided trees in the past for other exhibits. Finally, after one year since the planning had begun, the project was on its way.

Before the trees could be moved, they had to be selected by Horticulture and keeper staff. One gardener and two keepers drove out to choose the trees based on height, trunk width and location. If a truck could not reach the tree, then we could not get it. One week after the trees were selected, Michael Goldfarb of Homeworks of Indianapolis and Kevin Harmon, the zoo's Senior Gardener, began moving trees onto zoo grounds. In three days they brought in five cedar trees. Each tree took approximately four hours to pick up and deliver barring any problems.

At this point, crane operators began coming out to see if they could do the job and quote a price. A large crane was needed since from the service road to where the furthest tree would be placed was 22.86 meters (75 ft.). The other difficulty came with the weight of one of the trees which we planned on putting in with the root ball attached. This tree weighed approximately 3175.18 kilograms (7,000 lbs.) which increased the cost of the crane. We finally found a crane operator who quoted us a price of \$400.00.

Gathering equipment continued while we attempted to set a date which met the needs of all involved. We needed 15.24 meters (fifty feet) of 1.27 centimeter (1/2 inch) stainless steel cable, twenty 2.54 centimeter (one inch) cable clamps and twelve hold-down anchors (Fig.3). The cable had to be factory ordered at a cost of \$157.00. The hold-down anchors were made in-house out of 1.27 centimeter (1/2 inch) rebar. The loop measured approximately 7.62 centimeters (three inches) high and 2.54 centimeters (one inch) wide with "L" shaped sides, approximately 9.16 centimeters (four inches) in length with a 2.54 centimeter (one inch) bend. We also needed to rent a concrete or chop saw to cut into the gunite rock work in order to put in the hold-down anchors. The anchor would be sunk approximately 5.08 centimeters (two inches) into the rock work, then filled in with sacrete.

On 4 October at 10:00 AM four Forest keepers, four gardeners, Michael Goldfarb and a crane operator assembled to place the trees in the exhibit. With Michael on the wall of the exhibit, passing the ground crews' directions onto the crane operator, we managed to place all five trees. One was placed against the far west wall of the exhibit with a small portion of the end hanging over the pool. In order to break up the pace pattern of the bears, one was placed with the trunk end on the west corner of the upper ledge and was angled down. Another tree angled from the mid-west back wall to the west side of the exhibit. The most difficult tree to place was the large tree with the intact rootball. With the help of all eight staff members pulling and pushing, the tree finally slipped into place at the site where the substrate shape was planned. After nearly four hours of work, all the trees were placed and the exhibit was full (Fig. 4). At the time the decision was made to hold off on the substrate shape until the bears become bored with the new exhibit. This would also allow the new trees to shift and settle making it easier to assemble an aesthetically pleasing box with the use of cedar limbs, roots, and shot crete.

Kodiak Bear Exhibit Renovation, Continued

The trees were in place but the work was far from done. Seven polygon shaped holes had to be cut into the exhibit floor with a 30.48 centimeter (12") concrete or chop saw. Due to the saw blade size and location of trees in the exhibit, the holes could not be made large enough to use the original 12.70 centimeter (5") high hold down anchors, therefore, at the last minute, smaller anchors measuring 7.62 centimeters (3") high had to be made. This was not the only set back in cabling the trees down, the the tree trunks each had to have a 2.54 centimeter (1") hole drilled into it for the cable to go through. After breaking the handle off a 1.27 centimeter (1/2") hammer drill, the decision was made to wait until the next day when we could obtain a holehog drill. Due to these set backs, the trees were not anchored in one afternoon as we had planned. The work continued the next day once we had gathered the proper equipment. As with any large project involving lots of people from different departments, problems were bound to occur. To make a project like this run more smoothly a single coordinator should be clearly appointed. This would give all involved one person to bring their problem, questions, and concerns to. Also prior to starting the actual work, one should check and double check that all tools ate located and functioning properly. Finally, one last organizational meeting should be held to make sure all involved are still on the same track.

The total effect of the exhibit change on the bears' behavior will not be able to be documented properly for several months. A change such as this however, cannot help but provide them with more activity options. Behavioral enrichment is a job that comes from the heart; the sore wrists, sore backs, and wounded pride all disappear when one sees the bears active in a healthy way on exhibit. The combination of staff education, student education and bear enrichment made this project a total success.

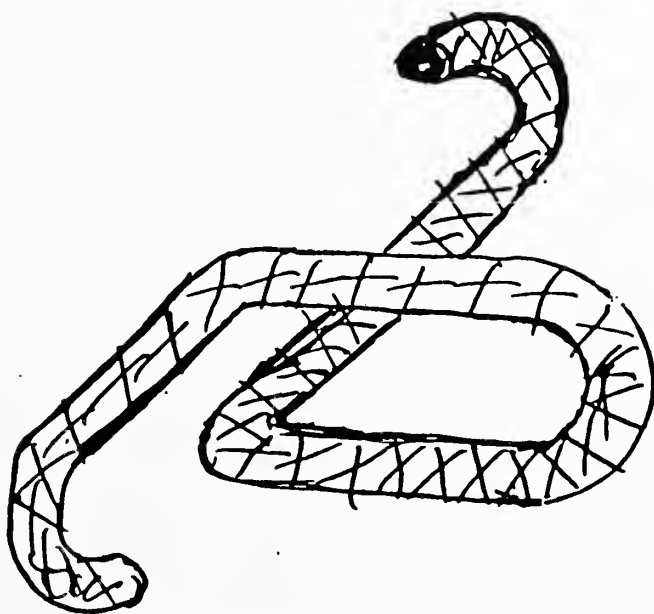
FIGURE 3: Hold Down Anchor

Height 7.62 centimeters (3 inches)

Width 2.54 centimeters (1 inch)

Length 10.16 centimeters (4 inches)

Made from 1.27 centimeter (1/2 inch) rebar



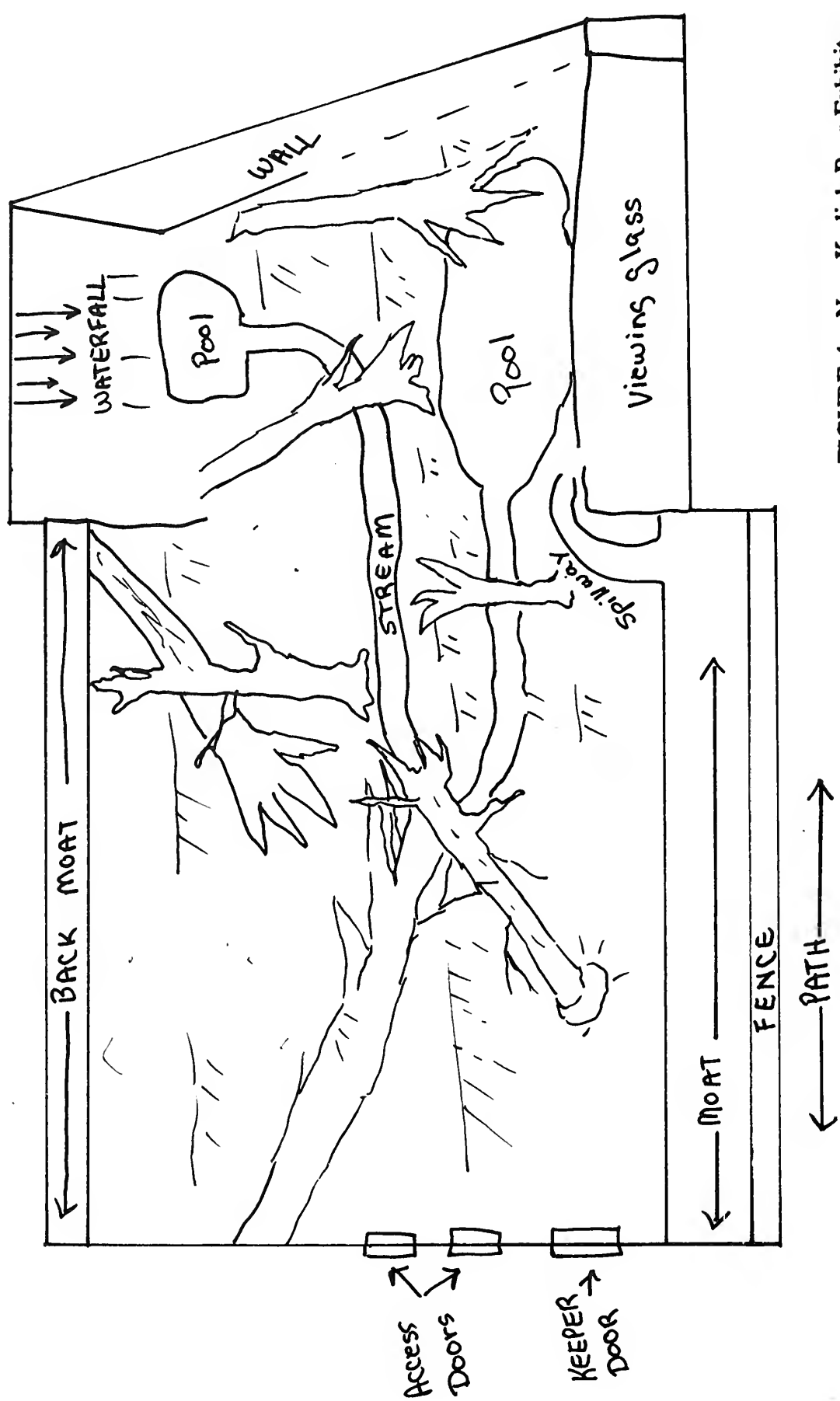


FIGURE 4: New Kodiak Bear Exhibit

List A

POLAR BEAR ENRICHMENT



BoomerBall®
BoomerBall® pieces
Spindle (bobbin)
Beer keg
Barrel (blue)
Bones
Rawhide bones
Browse
Road cone
Cardboard
Frisbee®
Log

Log toy
Omnibag
Pig's ear
Produce
Peanut butter
Honey
Rabbit
Live fish
Hooves
Football
Ice toy
Ice blocks with fish

KODIAK BEAR ENRICHMENT

BoomerBall®
Boomer Spool®
Browse
Assorted berries
Assorted nuts
Peanut butter
Assorted greens
(kale, romaine lettuce)
Cow chew hooves
Rawhide bones
Live fish
Feed bags
Straw
Coconuts

Logs
Trees
Ice blocks (w/ fruit and fish)
Honey
Bread
Assorted produce (Carrots, peppers,
bones, squash, onions, corn, beans,
pineapple, melon)
Meat trail
Boxes
Hay
Dried leaves
Sunflower seeds
Dog crunchies



Acknowledgments:

Katie Booth, Kevin Harmon, Larry Rice, Michael Goldfarb, The 1992-1993 Behavioral Enrichment Committee, The Forests/Deserts/Commons staff with special thanks to Bill Potter and Jeff Wines, and Wayne Sholtz and his middle school biology students.

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Planting for Animal Enrichment

(The following two articles are reprinted from *The Association of Zoological Horticulture Newsletter* (Vol.29: No. 2, March/April 1995) with permission of the Editor.)

Bronx Zoo/ Wildlife Conservation Park Bronx, New York

By Rob Halpern
Curator of Horticulture

Behavioral enrichment through horticulture? Animal behavioral enrichment has passed the "trendy" stage at most zoos. What polar bear does not have more toys than most five-year-old children? At the Bronx Zoo/Wildlife Conservation Park, there are artificial trees that automatically dispense honey to Kodiak bears and peanuts to Asian elephants and to gibbons; and artificial rocks which fling seeds to Gelada baboons. And yet, horticulture has not been much of a positive factor in animal behavioral enrichment. Oh, plants certainly do enrich the lives of our animal collection; the langurs' best day was when they destroyed the new bamboo planting; the baboons would be dismayed if they didn't have newly planted perennials and grasses to pull out; and the proudest eland I ever saw was wearing a newly planted tree on his head!

I have always thought that zoo horticulture would be better off if it did become animal enrichment more than it does. One scheme and plan is to enrich behavior of our human animals more than any other. (New York residents are usually very dysfunctional with plants. They have few role models to help them learn how to behave towards a landscape.) But we are looking at several simple enrichment ideas for the animals as well.

This large park was created with the idea of giving social animals the space to behave naturally. Our various grazing animals keep their pastures putting-green clipped, leaving assorted broad-

leaf weeds untouched. Eliminating the weeds, fertilizing, and irrigating the turf are essential to maintaining the look of the exhibit and providing ample material for the natural (though imaginative) behaviors of grazing. This year, with the approval of the vets, we will experiment with kelp-based fertilizers and petroleum-based contact herbicides. These management practices, along with careful selection of grass species to mix highly palatable types (for them) with less palatable types (for aesthetics), should allow us to have our grass and eat it to.

The mixing of desirable and undesirable grasses in an exhibit has been most successful in the new weavers' exhibit indoors at the World of Birds. St. Augustine grass sod was laid to create a savanna look, while potted weeping lovegrass and *Calamagrostis* were provided out of view for the birds to use in nest building. The birds clearly prefer the latter species and have left the St. Augustine untouched (there are times we think the exhibit is too lush!).

Perhaps of greater interest is the Kodiak bears' interest in fruit. In Alaska, late summer fruit of elderberry, viburnum, and brambles are favorite foods. We are endeavoring to establish *Sambucus* in rock crevices in the exhibit to overhang the bears. This will protect the plants from digging and stomping, while dropping fruit to where the bears can find it. Since *Ailanthus* grew in the crevices, why not more useful plants?

More experiments are needed from all of us to determine how to mix "exhibit" plants with "behavioral enrichment" plants.

Audubon Zoological Garden New Orleans, Louisiana

By Tran Asprodites,
Director of Horticulture and
Rhonda Votino, Keeper

It is very easy for us as horticulturists to envision a landscape; however the animal, whether mammal or reptile, sees the flora in their immediate surroundings very differently. The plant is either edible or not, a new toy or perhaps just another "thing" placed in their "turf" to be dealt with or ignored. Predicting the animals' response is virtually impossible, but we still try. Are our attempts futile? Yes or no.

Planting for Animal Enrichment. *Continued*

Plant toxicity being the number one concern here at Audubon Zoo, the animal and horticulture staffs work together to design, install, and manage the landscape. The Malayan sunbear exhibit is one very successful example of this cooperative effort. Ficus, bamboo, and many other plant species thrive in the exhibit with Bhanu and Byoumi, the sunbears. Despite the occasional mangled small tree or shrub, or hole(s) dug by the pair, the exhibit and the animals continue to flourish.

Most of the damage is a result of digging. Sunbears are known for their long sickle-shaped claws which are used for shredding vegetation and substrate in search of insects (especially termites and grubs), and earthworms. The keepers provide activities that stimulate their animal charges without destruction of the exhibit. The bears usually concentrate their destructive digging to a mulch pile that is provided, and food treats are regularly placed in and around the pile. Treats are also hidden in the very large live oak and cypress logs.

A morning feeding activity is done daily for the public that involves Boomer Balls® filled with small pieces of fruit. The Boomer Balls® have holes drilled in them so that Bhanu and Byoumi can manipulate the balls until the fruit bits fall out—they do this while laying on their backs, to the amusement of the visitor. Of course, the animal care aspect of this exhibit is only part of what has made it a success.

Are our animals' lives enriched by the cooperative efforts of the keeper and horticulture department? Sunbears are expert climbers. In the wild, the usually nocturnal sunbears can spend much of their day sleeping or sunbathing in trees. The plants do seem to cool the exhibit. Tallow and ficus trees create shady areas for the sunbears to lounge. Byoumi, the female, is often seen crashed-out in the afternoon under these trees. The male, Bhanu, after tiring himself out from foraging, can be seen napping up in the forks of the massive sections of live oak placed in the exhibit. The large tree parts are also heavily used for scratching while they search for insects. Finally, the Bermuda turf definitely is a softer surface than concrete to prowl around on. The entire exhibit yard is seeded several times each year.



All of the cooperative effort of landscaping appears to be beneficial to the psychological well-being of these animals. Animals in captive situations often show stereotypical behavior such as pacing. Stimulating behavioral activities and creative landscaping are keys to curbing this unwanted behavior. The sunbears do some pacing in the late afternoon, but it is our hope to eliminate this behavior by increasing activities and by installing additional plantings. Is the exhibit a successful example of planting for animal enrichment? We believe it is; in fact, we intend to plan all of our future animal exhibit plantings based on that success.



Pine Cone Treats for Birds

To increase foraging behaviors, we offered some of our birds pine cone treats. Open pine cones were collected after they had fallen. Wire was placed around the base so that they could be tied to a tree branch in a naturalistic fashion. Treats such as seed, mealworms, and raisins were dipped in honey and stuffed in the holes. The birds were usually not interested in the seed. However, they enjoyed the mealworms, and the honey kept the worms in place. It usually took two to three days for the birds to take all the treats out; if we left the pine cones in too long (one to two weeks), the birds would typically shred them.

*--Stacy Palm, Arizona-Sonora
Desert Museum, Tucson, AZ*

*Reprinted with permission from
The Shape of Enrichment,
Vol. 3, No. 4, November 1994*



Whose Life is Really Being Enriched Here?

By Suzanne Stern
Docent and Behavioral Enrichment Volunteer
Los Angeles Zoo, Los Angeles, CA

Around my house, the phrase, "If it's Tuesday, it must be Belgium" has been altered slightly to "If it's Thursday, it must be Mom's zoo day!" And if Thursday is zoo day, it can only mean one thing--Wednesday night is prep time!

My family is well trained. They know that they must forage for themselves on Wednesday night, while I prepare tasty treats for my zoo buddies. Wednesday night is the time to chop and freeze fruit and fruit juices in cleaned out cottage cheese and yogurt containers. After that, there are pinecones to be stuffed with peanut butter (tiny amounts, for we try to keep calories to a minimum), raisins, nuts, fruits, and whatever is the tidbit of the day for a specific animal.

Then tasty oatmeal paste is mixed using oats, canned pumpkin, honey, raisins, peanut butter "just a smidgen" for extended shelf life and a more crunchy edible for the animals. All the delicious smells emanating from the kitchen and all the tasty treats being created are for use at the zoo in small amounts as one part of the overall enrichment program. I do all this just to spend the early morning hours once a week at the Los Angeles Zoo. It's my zoo away from the zoo of my normal week-corporate life-and a great way to spend the day.

For the past few years, I have been involved with the very creative and highly successful Behavioral Enrichment Program at the Los Angeles Zoo. Working with primates (great apes, lesser apes, and monkeys) has given me the opportunity to help create a more interesting environment, provide stimulating methods to attain food, and put variety into their day. It has been creative, fun, challenging, and sometimes frustrating, but in the end, always rewarding.

One of the first challenges my volunteer partner and I faced came from our gelada baboon (*Theropithecus gelada*) family. The troop, which consists of 1.2 adults, two juveniles, and one infant, had recently been moved to a new enclosure and were adjusting slowly to the change. They were a timid group, and although the new exhibit allowed for much freedom of movement in a relatively large area, the troop tended to stay huddled together in one small corner. Our first mission was to get the baboons to move freely. We took their daily breakfast and "trailed" it through the exhibit. We then scattered several items throughout the exhibit, such as fruit pieces and oatmeal paste mixtures. They followed our trails, eating their regular diet, but the supplemental items were not to their liking.

Our research had indicated that wild geladas live primarily on grain, so we decided to try a different tactic. Locating a natural food store that sold items in bulk quantities, we loaded up on a variety of grains such as soy beans, cracked wheat, groats, and whole wheat kernels. Each time we enriched the gelada exhibit, we pulled broadleaf, wild grass from behind-the-scenes areas at the zoo and spread it throughout the exhibit in tiny clumps. In each little pile of grass, we sprinkled small amounts of the uncooked grains and added small amounts of live mealworms to many of the piles.

It was an instant hit! The geladas were quick to move in on the grassy piles and spent large quantities of time sifting through to carefully select each item in order of their personal favorites. The females, juveniles, and dominant male enjoyed all the treats but in a different order of preference. The entire troop became more active and quite vocal in their grunts while eating away. With the small kernels of grain and tiny grass blades, much time was spent foraging and eating, as opposed to the old days of sitting still in huddles.

Another successful behavioral enrichment tactic was one used in both siamang (*Hylobates syndactylus*) exhibits. Our adjacent enclosures house an adult pair and a singly housed female. We decided to take their food foraging to new heights! The daily morning meal went from the feeding pan on the ground to a more natural presentation in

Whose Life Is Really Being Enriched Here? *Continued*

the vegetation. We took bananas, grapes, sweet potatoes, carrots, and even peanuts in the shells and stuck them individually on branches in the bushes and trees in their exhibit. We enriched the zoo diet by occasionally adding one or two items in small quantities, such as kumquats, cherry tomatoes, lemons, oranges, and vegetables. These items were presented whole.

Because the Los Angeles Zoo Siamangs are captive born, we were somewhat unsure of what the reaction would be to "breakfast on the run," but it was a raging success from day one. The siamangs swung from place to place, using their long arms to retrieve the impaled food items. Again, the food items were eaten in a definite order of preference. Breakfast was still consumed fairly quickly, but the amount of movement and increased feeding time were very satisfying to observe. To keep the siamangs busy for longer periods of time, some items were placed on the top of the exhibit, which is covered with a chain link roof. Pinecones stuffed with sliced fruits and nuts and branches of cut browse provided the siamangs with items to pick at through the roof and kept them high in the exhibit and more arboreal in their daily behaviors.

For many of the other primates, a wide range of ideas and activities have been tried. Some have certainly been more successful than others. Many of the items we tried work well for several different animals. Sometimes items were simply placed in the exhibit in full view. Some of these included frozen fruit popsicles, stuffed pinecones, and burlap sacks stuffed with treats—a small fruit, popcorn, raisins, and sunflower seeds are placed inside and the sack is tied closed with small string from the burlap. The gorillas and orangutans especially like to "break into" the bag and then have much enjoyment playing with the emptied bag after the foods have been eaten.

Hiding items throughout the exhibits of guenons, macaques, orangutans, and gorillas gives them much to do for periods of time. Goopy mixtures of oatmeal paste provide a super treat to smear in small amounts on rocks, logs, and crevices in their exhibits. Baked cookie-style, it's great for sticking in nooks and crannies.

You can see why Wednesday night is take-out-food night for my family—I'm much too busy creating interesting treats and tidbits for my furry friends. My time spent as a Behavioral Enrichment Volunteer has enriched not only the lives of the animals I work with, but my own as well.

Oatmeal Paste

Add the following to a food processor and blend until mixture forms a paste:

Oatmeal	Grape nuts or wheat germ cereal
Dry non-fat milk	1/4 cup natural peanut butter
Raisins	Several tablespoons honey
Several slices canned pineapple in juice	

Use sparingly to dab in various areas of the enclosure.

Pumpkin Paste

Add the following to a food processor and blend until mixture forms a paste:

Oatmeal--approx. 4 cups	1/2 cup peanuts
1 can (1 lb.) pumpkin	1/4 cup honey
1/4 cup peanut butter	1/2 cup raw sunflower seeds
Several shakes of cinammon,	3/4 cup raisins
ginger, allspice	Orange juice to create paste

Make 3 to 9-inch logs. Small pieces can be broken off and stuffed in logs or crevices or pressed onto sides of rocks. Good handling consistency.

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L.I.N.K.
(Liaison and Information Network for Keepers)

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ARIZONA - Vacancy

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CALIFORNIA (Northern) - Jean Lai, Oakland Zoo, 9777 Golf Links Rd., Oakland, CA 94605 and
Ruby Lara, Sacramento Zoo, 3930 West Land Park Dr., Sacramento, CA 95822-1123

CALIFORNIA (Southern) - Vacancy

COLORADO - Vacancy

CONNECTICUT - Jeanette Nadeau, Roger Williams Park Zoo, Providence, RI 02905

DELEWARE - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA 19104

FLORIDA - Rick Smith, 5752 Stoneridge, Orlando, FL 32839

GEORGIA - Fred Alvey, Zoo Atlanta, 800 Cherokee Ave. S.E., Atlanta, GA 30315

HAWAII - Vacancy

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IOWA - Carla Wieser, Omaha's Henry Doorly Zoo, 10th St. & Deer Park Blvd., Omaha, NE 68107

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MISSOURI - Vacancy

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NEBRASKA - Carla Wieser (see address under Iowa)

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NEW HAMPSHIRE - Jeanette Nadeau (see addresses under CT)

NEW JERSEY - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460

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VERMONT - Jeanette Nadeau (see addresses under CT)

VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104

WASHINGTON - Vacancy

WEST VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104

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DISTRICT OF COLUMBIA - Theresa Maas (see address under PA)

Province of Ontario - Vacancy

Provinces of Manitoba & Saskatchewan - Bob Debets (see address under ND)

Province of Quebec - Vacancy

Provinces of Alberta & British Columbia - Grant Tkachuk, 10139 157th St., #206, Edmonton, Alberta T5P 2T9

Atlantic Canada - Bernard Gallant, RR # 7, 1081 Ryan Road, Moncton, N.B., E1C 8Z4

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing dates for positions available. There is no charge for this service and phone-in or FAX listings for positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.

CURATOR...the Wildlife Discovery Program (a Houston I.S.D. Magnet School) is now taking applications for the 1995-96 school year. The Curator position vacancy will become available 18 August, 1995, and continue until 31 May, 1996 (10 month contract/benefits). The duties of this position include planning and experiential instruction in an outdoor setting at the Houston Zoo to 3rd grade students. Requirements are two or more of the following: High school diploma (required); education experience; wildlife biology background; environmental/outdoor education experience; or summer camp counselor experience. Salary \$1030.00/month for 10 months with benefits. Applications will be accepted until **15 July, 1995**. Send cover letter with resumé and three (3) references to: Ms. Karyl Walz, Coordinator, Wildlife Discovery Program, 1513 North MacGregor Way, Houston, TX 77030.

ANIMAL HEALTH TECHNICIAN...the Toledo Zoo is seeking a veterinary technician to assist veterinarian in following areas: medical procedures, administering gas anesthesia, administer vaccinations, medication, immobilizations and maintain drug and equipment supply levels. Will also provide routine vet tech functions in addition to communicating between veterinarian and keepers on drug administration, nutrition, and diet implementation. Requires Veterinary Technology degree and ability to pass the national Animal Health Technology exam and registration in Ohio. Starting salary \$21,210.00 per year with benefit package. For consideration, submit resumé **by 31 May 1995** to: Nancy Foley, Director of Human Resources, The Toledo Zoological Society, P.O. Box 4010, Toledo, OH 43609.

ANIMAL KEEPER...Lincoln Park Zoo has an opening for a full-time animal keeper. High school diploma required. Bachelor's Degree and experience in routine animal husbandry preferred. Under general supervision, responsible for all aspects of daily animal care and maintenance. Assignment may include any animal department of the zoo. Candidate to have effective oral and written communication skills. Salary commensurate with experience. Send resumé to: Human Resources, Dept. AKI, Lincoln Park Zoo, 2200 N. Cannon Dr., Chicago, IL 60614.

ZOOKEEPER...Reid Park Zoo, Tucson, AZ. Requires high school diploma and at least one year of demonstrated experience in the management of exotic, non-domestic animals. Responsibilities include: complete husbandry of animals and exhibits in assigned area; animal observation; medical treatment; capture and restraint; and public contact. Salary \$19,320.00 to \$25,896.00 plus excellent benefits. Contact City of Tucson Human Resources, 110 E. Pennington, Tucson, AZ 85726-7210 or call (520) 791-4241 **by 31 May 1995**.

INSECT KEEPER...Woodland Park Zoo, Seattle, WA. Care and maintenance of insect collection in the Tropical Rain Forest and children's zoo. Care for other animals as assigned. Prepare special foods and diets, infant feedings, clean and disinfect animal and exhibit areas, administer medications, make and record observations, prepare reports, assist with movement of animals and animal training, give visitor talks and interact with the public. Requires equivalent of two (2) years of experience caring for zoo specimens--emphasizing live insect collections--in an accredited facility. Salary \$2,381.00 per month. Send resumé **by 2 June 1995** to: S. Bergstrand, Seattle Personnel Dept., 1219 Dexter Horton Bldg., Seattle, WA 98104-1793 (206) 684-7973. AA/EOE. NOTE: There will be other permanent, part-time and full-time general Zoo Keeper positions occurring. If you have not submitted your resumé to the Personnel Dept. in the last year and wish to be considered for these general positions, please mail your resumé to the above address **by 2 JUNE 1995** to be considered for this set of interviews. Resumés are retained in the resumé talent bank for a year.

Opportunity Knocks, Continued

REGISTRAR/Animal Records Keeper...Kansas City Zoo. Prefer accredited four-year college degree in biology or related field and experience in a registrar-type position in a zoological institution. Position will serve as a principle advisor to senior animal staff on animal records management, legal and logistical aspects of collection activities, maintenance of all animal records including data entry, handling of animal purchases and shipments, insure compliance with zoo policies and national/international regulations. Salary \$1,742.00 - \$2,592.00 monthly plus excellent benefits. Nonresidents, if appointed, must establish residency within the city limits of Kansas City, MO. Send resumé by **5 June 1995** to: Reta Gaebler, Human Resources Dept., City Hall, 414 E. 12th St. Kansas City, MO 64106. EOE.

ELEPHANT KEEPER...Philadelphia Zoo. Position requires a minimum of two years of experience working with elephants. Ability to work cooperatively with elephant management team essential. Responsibilities include exhibit maintenance, public education, participation in a free contact elephant management program. Send cover letter and resumé to: Human Resources, The Philadelphia Zoo, 3400 West Girard Ave., Philadelphia, PA 19104.

The following two (2) positions are available at The ZOO, 5701 Gulf Breeze Parkway, Gulf Breeze, FL 32661. Send required resumé or other requirements to this address to the attention of the individual listed with each position.

EDUCATION CURATOR...requires degree in a life science or appropriate education area. Will develop, manage and evaluate new/existing programs with emphasis on fee-based and community outreach programs. Must have excellent verbal/written communication skills. Curator responsible for training permanent and seasonal staff/docents. Send cover letter, resumé and salary requirements to Pat Quinn.

HOOFSTOCK/ELEPHANT BACK-UP KEEPER...requires two years experience and hands-on knowledge of care and maintenance of elephants. Responsibilities include daily care of hoofed animals and back-up keeper for Elephant Department. Competitive salary and benefits. Send resumé to Jean Benchlmlol, General Curator.

ZOO ATTENDANT I (Nutrition Services).....Fort Worth Zoo. Degree in nutrition/dietetics, animal science/biology preferred. Responsible for the preparation of diets and delivery to animal areas. Must be able to routinely lift and/or carry objects weighing 50 pounds and follow detailed daily routine. Will work in team environment which includes keepers, commissary manager and nutritionist. Send letter, resumé and (3) references by **16 June 1995** to: Wanda Smallwood, Personnel Department, City of Fort Worth, 1000 Throckmorton St., Fort Worth, TX 76102.

ANIMAL KEEPER...requires a high school diploma and one year experience working with non-domestic animals. Job responsibilities include, but are not limited to: routine feeding, cleaning, and exhibit maintenance. Salary \$17,000.00-\$18,000.00, plus excellent benefits. Respond in writing by **31 May 1995**. Send resumé to: Tim Gunther, Director, Bergen County Zoological Park, 216 Forest Ave., Paramus, NJ 07652.

CHIMPANZEE CAREGIVER...ome full-time position open. Requires two years of college level course work, two years experience in the care of exotic animals; OR an equivalent combination of experience which provides the required knowledge, skills, and ability. Primate experience a plus. Assist in the responsibility of caring for approximately 80 Chimpanzees (*Pan troglodytes*) in a breeding colony. Must be willing to make at least a two-year commitment. Excellent benefits. EOE. Applicant must have a negative TB skin test, negative hepatitis B surface antigen test, and evidence of a measles booster or natural disease prior to employment. Send letter of interest (with requested salary), resumé and three letters of reference to: Jo Fritz, Director, Primate Foundation of Arizona, P.O. Box 20027, Mesa, AZ 85277-0027. Position open until filled.



AAZK Membership Application

Name _____ check here if renewal []

Address _____

City _____ State/Province _____ Zip _____

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- ☐ \$25.00 Associate/U.S.
*Those not connected with
an animal facility*
- ☐ \$50.00 or up Contributing/U.S.
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an animal facility*
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Mail this application to : AAZK Administrative Offices, Topeka Zoo, 635 S.W. Gage Blvd., Topeka, KS 66606-2066 U.S.A. Make checks/money orders payable to AAZK, Inc. Must be in U.S. FUNDS ONLY.

Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

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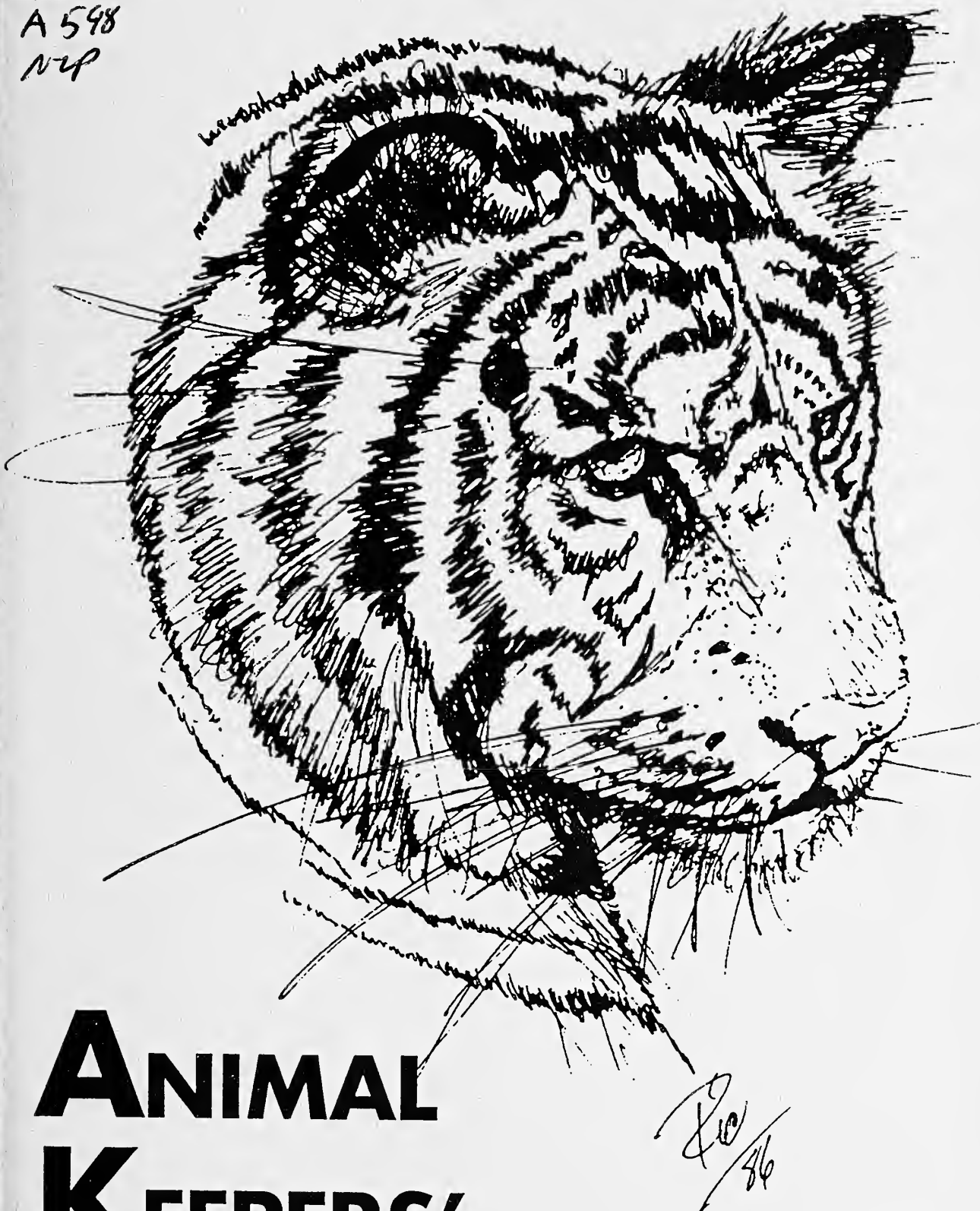
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ANIMAL KEEPERS' FORUM

Dedicated to Professional Animal Care

June 1995

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Barbara Manspeaker, Administrative Secretary

Executive Director: Ed Hansen, AAZK, Inc.

June 1995

Volume Twenty-two

Number Six

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AAZK PUBLICATIONS - CONTINUING DATA COLLECTION

Zoo Infant Development Project

Teri Maas/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Kim Livingstone, L.A. Zoo (Passerines)

Jeanne Bocconcelli, Newark Museum Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Grand Rapids, MI



printed on recycled paper

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Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and **double-spaced**. All illustrations, graphs, charts and tables should be clearly marked, in final form, and should fit in a page size **no greater than 15cm x 25 1/2 cm (6" x 10")**. Literature used should be cited in the text (Brown, 1986) and alphabetically in final bibliography. Avoid footnotes. Include scientific name of species (as per ISIS) the first time it is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs., etc.). Black and white photos **only** are accepted. Color slides should be converted to black and white glossy prints (minimum size 3" x 5") before submission. Clearly marked captions should accompany photos. Please list photo credit on back on photo.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

DEADLINE FOR EACH ISSUE IS THE 15TH OF THE PRECEDING MONTH

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association. Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$2.00 each.

This month's cover features a Bengal Tiger (Panthera t. tigris) drawn by AAZK Board Member Ric Urban who is a keeper in the Aviculture Department at the Houston Zoo, Houston, TX. Like its relative, the Siberian Tiger, the Bengal is threatened in most of its range due to human encroachment and the illegal trade in its fur, bones and other body parts. The stripes of a tiger seem to form the design of an old Chinese symbol of royalty, and this animal is important in Chinese mythology. The original habitat of the tiger species was Siberia; from there it spread to India, Indochina, Burma, Thailand, and the Caucasus. Tigers are solitary except at mating time when the male and female may share a common territory. These carnivores have powerful muscles, strong claws and sharp teeth which they use to hunt and may consume as much as 200 pounds of meat in one meal. Litters vary from 1-5 young and are born approximately every three years. Thanks, Ric!

Scoops

and

Scuttlebutt

Diet Notebook Project Seeks Reptile Coordinator

Diet Notebook Coordinator Susan Bunn Spencer reports that the Project is back on track and working to prepare for publication of additional volumes including Mammals, Vol. II, Birds, Reptiles & Amphibians, and Fish & Invertebrates. Coordinators are in place for all sections except Reptiles.

WANTED: Person willing to work long hours as the Reptile Coordinator for the Diet Notebook Project. New diets need to be solicited, all diets need to be entered onto a database, and proofreading for a finished product is needed. There will be a deadline schedule to meet. A job description can be furnished upon request.

If interested, send a resumé and letters of reference to: Susan Bunn Spencer, 8336 Courtland Drive NE, Rockford, MI 49341 OR CALL (616) 866-7455.

A Note from Andy Lodge and Ngare Sergoi

Andy wishes to sincerely thank all those individuals, AAZK Chapters and institutions that have sent school supplies for him to distribute to Kenyan school children in the area around Ngare Sergoi Rhino Sanctuary (Lewa Wildlife Conservancy). The children and their teachers have been thrilled with the pencils, crayons, markers, tablets of paper, etc. that have made it possible for them to continue to learn and become educated. However, Andy has asked that such donations be discontinued at present until the inventory of supplies on hand has been transported over to Kenya and distributed. The response to this project has been so overwhelming that supplies are currently on hand to last for some time. We will announce in AKF when supplies are once again needed for this most worthwhile endeavor. Again, many thanks from Andy and the Kenyan school children!

AKF Welcomes New Legislative Column Coordinator

Animal Keepers' Forum is pleased to welcome Georgann B. Johnston aboard as Legislative Advisor for AAZK. Georgann is a lawyer by vocation and a volunteer keeper (Sacramento Zoo) and wildlife rehabilitator by avocation. She brings a great deal of enthusiasm and knowledge to this task and we look forward to working with her to keep the AAZK membership aware of current legislative trends and actions affecting the world's wildlife. Georgann's first legislative Update column appears in this issue.

ADT Forms Available Upon Request

Animal Data Transfer Forms for zoos and aquariums are available free of charge upon request. This is a professional service provided by AAZK. Contact: Bernie Feldman, Burnet Park Zoo, 1 Conservation Place, Syracuse, NY 13204. If your facility is not already using the ADT form, please encourage your administration to implement its use whenever an animal is shipped.

IZY Collection Available By Bid

Bids are being accepted through 30 June 1995 for a hardcover set of *International Zoo Yearbook (IZY)*, Volumes 1-30. All but Volume 1 are first editions, and Volumes 6 through 30 still have dust jackets. All funds generated from the sale of this set will go to the Tree Kangaroo Species Survival Plan special fund for the Avian TB Research Project. Please contact Judie Steenberg at the following address for more information or leave a message at (206) 684-4011 - Judie Steenberg, Woodland Park Zoological Gardens, 5500 Phinney Ave. North, Seattle, WA 98103.

ZCOG Wish Lists Could Use Some Help

Eva Sargent, Executive Director of ZCOG (Zoo Conservation Outreach Group) informs AKF that her organization has a number of zoos in Mexico and Central America with "wish lists" for materials/supplies to help them upgrade their facilities. Examples of items included on these lists are: Educational Materials, Computers & Office Equipment, Veterinary Equipment, Surgical Instruments, Medicines and Anesthetics, Disinfectants, Immobilization Equipment, Laboratory Equipment, Gardening and Landscaping Materials, Reptile, Bird, Fish and Horse Equipment, Animal ID Equipment, and Photographic, Video and Audio Equipment. If you, your Chapter or your institution would like more information on how you may help out a Mexican or Central American zoo with their "wish lists" contact ZCOG by calling (504) 861-5104 or writing them at 6500 Magazine St., New Orleans, LA 70118.

Books Available from Book Review Committee

We currently have the books listed below available to be sent out to reviewers. Individuals who write a book review for publication in AKF get to keep the book that they review. Book reviews are due no later than 60 days after receipt of the book. Those with book reviews still outstanding are not eligible to request additional books to review. If you are interested in reviewing books for AKF, write us with your name, address and areas of interest so that we may match you up with appropriate books to review.

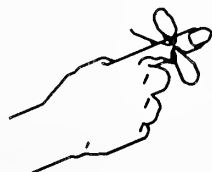
The following titles are currently available:

Animals....our return to wholeness by Penelope Smith from Pegasus Publications 355pgs.

Into Africa by Craig Packer from The University of Chicago Press 280pgs.

Spell of the Tiger: the man-eaters of Sundarbans by Sy Montgomery from Houghton-Mifflin 230pgs.

If interested in reviewing any of these titles, call Susan at 1-800-242-4519.



Reminder

You are reminded that the AKF Editorial Staff is still seeking articles on hand-rearing for a dedicated issues tentatively planned for August 1995. As of this writing we do not have enough articles on this topic to put together an issue, so we need your help. Diaries on hand-rearing, diets used in hand-rearing, and any other areas pertinent to hand-rearing are needed. **Deadline is 1 July 1995.**

We are also seeking articles on shorebirds for a special issue. Such articles might include diets, husbandry techniques, exhibit design, breeding problems/successes, enrichment, etc. **Deadline for material on shorebirds is 1 October 1995.**

**Support Your Professional Journal by
Submitting an Article SOON !**

From the President

The Board of Directors is announcing a call for Membership Comment on the State of the Association or to petition the Board to review any issue or topic that a member or Chapter deems appropriate. Such comments or petitions must be submitted in writing to the Administrative Secretary **by 10 August 1995** (45 days prior to the Conference). Included should be a summation of the topic to be discussed in order to allow the Board to assemble pertinent background information prior to the meeting.

The following are highlights of the minutes of the Midyear Board Meeting held on 23-24 April in Topeka.

There will be a proposed Bylaw change (in reference to IRS rulings concerning membership rights to participate), and a Proxy Ballot published in the July issue of *Animal Keepers' Forum*.

Susan Bunn Spencer, Diet Notebook Coordinator, attended the Nutrition Advisory Group Conference in Toronto, Canada. She served as the AAZK designee to serve on the Nutrition Records Keeping System Working Group whose members include representatives from the international zoo community as well as academic and governmental agencies.

The Conservation, Preservation and Restoration Committee Grant Packet was approved. The Keeper Training Package has 26 of the 49 sections in rough draft form. The *Animal Keepers' Forum* has a new letterhead and will have a new size and color accent beginning with the July issue. The advertising folio is ready to be sent out to potential advertisers in July.

Over the past several years, the Board has been standardizing forms for Committees and Chapters. I am pleased to announce that we will see the fruition of these efforts by the annual meeting. The Board reviewed the Operations Manual and it is going through a final edit. All Chapters will receive a copy of the manual and Regional Coordinators will receive manual sections pertinent to their duties.

I submitted a Chair/Coordinator Notebook for Board Review. The approved format will include master copies of report forms and letterhead along with other pertinent information. These notebooks will be given to all committee and project heads at the Annual Meeting in Denver.

As a reminder to committees and projects, all correspondence to other organizations or items for *Animal Keepers' Forum* must go through your Board Oversight before being sent and/or published.

A complete copy of the Midyear Minutes will be sent to all Chapters. If you are not a member of a Chapter and wish to receive a copy, please contact me or the Administrative Secretary.



Janet McCoy, AAZK, Inc. President
Metro Washington Park Zoo, Portland, OR



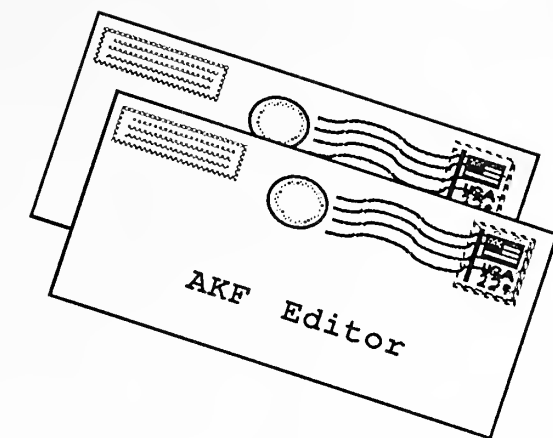
Letters to the Editor

Dear Animal Keepers' Forum Editor:

In your May issue, you printed a letter from Ms. Tammy Root of Topeka concerning her opinions about the Masters of Science in Environmental Studies (MSES) program at Friends University in Wichita, KS. Because she chose the Zoo Studies track and commented on her experience at the Sedgwick County Zoo, we feel compelled to respond.

First the program is a rather unique cooperative venture between the University and the Sedgwick County Zoo. Students in the MSES program take nine courses, each meeting one evening a week for eight weeks, and also choose a field in which they will complete a practicum. Over the past few years, several students have selected our Zoo as their practicum site. Because this program is geared towards working professionals from many different interests, the evening lecture courses do not deal specifically with the unique challenges of zoos. It is for this reason that we ask graduate students to audit the two undergraduate courses -- *Zoo Science* and *Management of Zoo Populations*. These courses are taught by our zoo staff on zoo grounds and are a good introduction to our facilities, philosophy and the work of the animal curators. Graduate students are asked to keep up with the reading for their own benefit, but grades are not given, nor is attendance mandated.

While Ms. Root's description of the required number of practicum hours was accurate, recent changes in the program have



streamlined the experience and made the practicum more challenging for graduate students. All incoming students must now submit a proposal for individual research and are assigned a zoo mentor. In addition, we do not, nor have we ever, required that all practicum hours must be completed at our zoo. In a previous MSES class, one student completed major portions of his work at the Tulsa Zoo.

We are sorry that the program did not fulfill Ms. Root's expectations, but it should be pointed out that her evaluation is based on a very limited exposure to the program. The program is relatively young, having graduated only two classes thus far, but we feel that it is developing into an excellent course of study for the aspiring zoo professionals.

Sincerely,

Brad Batdorf, Curator of Education
Sedgwick County Zoo

Alan Maccarone, Ph.D.
Director of Zoo Studies
Friends University



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Coming Events

Zoos: Committing to Conservation

July 13-16, 1995

Columbus, OH

Hosted by the Columbus Zoo. For further information, contact Beth Armstrong, The Columbus Zoo, Box 400, 9990 Riverside Dr., Powell, OH 43065-0400; (614) 645-3426.

Tenth International Conference on Bear Research and Management

July 16-20, 1995

Fairbanks, AK

For additional information on registration contact: Conferences and Special Events, 104 Eielson Building, P.O. Box 757800, Fairbanks, AK 99775-7800, Phone (907) 474-7800, Fax (907) 474-5592, E-mail fyci@aurora.alaska.edu.

15th Annual Association of Zoological Horticulture Conference

July 22-25, 1995

Montreal, Canada

Hosted by the Montréal Biodôme. AZH will be meeting concurrently with the American Association of Botanical Gardens and Arboreta and their host institution, the Montréal Botanical Garden. Conference and hotel registration deadlines are 15 June 1995. For further information contact: Stéphanie Labelle, Biodôme de Montréal, Tel. (514) 868-3046, Fax (514) 868-3065.

21st Convention of the American Federation of Aviculture (AFA)

August 9-12, 1995

New Orleans, LA

This year's conference will focus on Central and South American avian species. For more information contact the AFA Business Office at (602) 484-0931.

AAZV/WDA/AAWV 1995 Joint Conference

August 12-17, 1995

East Lansing, MI

Conference will be held jointly with the American Association of Zoo Veterinarians (AZV), the Wildlife Disease Association, and the American Association of Wildlife Veterinarians. Program will include paper sessions, workshops, student and graduate competition and poster session. For conference information contact Wilbur Amand, VMD Executive Director, 3400 W. Girard Ave., Philadelphia, PA 19104-1196; phone (215) 387-9094; FAX (215) 387-2165.

The International Society of Zooculturist Annual Conference

August 23-26, 1995

Idaho Falls, ID

To be held at the Tautphaus Park Zoo. For more information contact: Bill Gersonde, Superintendent, Tautphaus Park Zoo, Box 50220, Idaho Falls, ID 83405. (208) 528-5552.

Coming Events, Continued

The 16th Annual Elephant Managers Workshop

October 10-14, 1995

Tacoma, WA

Headquartered at the Tacoma Inn. For further information contact: Bruce Upchurch or Sally LaTorres, Point Defiance Zoo & Aquarium, 5400 N. Pearl St., Tacoma, WA 98407-3218, (206) 591-5337, ext. 154.

Second Annual Conference of the Association of Reptile and Amphibian Veterinarians

October 26-29, 1995

Sacramento, CA

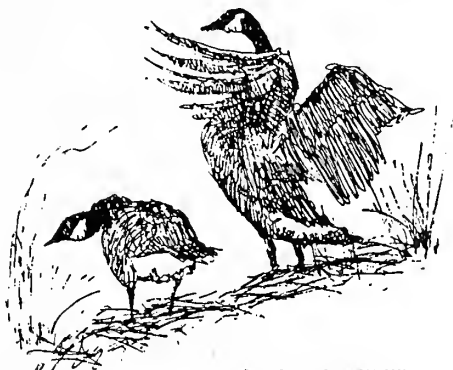
Will include Scientific Program, Wet Labs/Workshops and a Trip to the Sacramento Zoo. For conference registration information contact: Wilbur Amand, VMD, P.O. Box 605, 1 Smithbridge Rd., Chester Heights, PA 19017; Fax (215) 387-2165.

Association of Zoo Veterinary Technicians 15th Annual Conference

Oct. 30 - Nov. 2, 1995

Baltimore, MD

To be held at the National Aquarium. Conference will include sessions on reptile, avian, primate, hoofstock and aquatic medicine, immobilization, hematology, clinical and gross pathology, hospital techniques, and case reports. In addition, there will be a wet-lab. For more information contact: Jenni Jenkins, LVT, National Aquarium in Baltimore, Pier 1, 501 E. Pratt St., Baltimore, MD 21202; tel: (410) 656-4256; Fax (410) 576-1080.



AAZK Announces New Professional/Contributing Members

Cindy Smith, Jenkinson's Aquarium (NJ)
Maria Montgomery, National Zoo (DC)
Joseph Robertia, Jr., Lion Country Safdari (FL)
Randy Scheer, Folsom Children's Zoo (NE)
Cindy S. Smith, Dallas Zoo (TX)
Tammy McRoberts, Houston Zoo (TX)
Daniel J. Bekins, Heritage Park Zoo (AZ)
Martha A. Johnson, San Diego Zoo (CA)
Stacey Southard, Marine World.Africa USA (CA)

Christopher James, National Zoo (DC)
Chad A. Glasner, SFCC Teaching Zoo (FL)
Debra A. Christianson, Lincoln Park Zoo (IL)
Betsy Young, Little Rock Zoo (AR)
Scott Baggett, Ellen Trout Zoo (TX)
Holly Brown, San Antonio Zoo (TX)
John Kinkaid, San Diego Zoo (CA)
Kurt Kreinheder, Ostrich World (CA)
Eric C. Dailing, Endangered Species (WA)

New Contributing Members

Christina L. Darby, Huntsville, AL
Wildlife Educators of America, Inc., Castaic, CA

Renewing Contributing Members

Kent K. Fellows, Docent, Seneca Park Zoo, Rochester, NY
Folsom Children's Zoo, Lincoln, NE



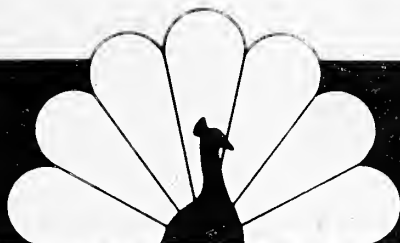
AAZK Book Sale

Sale price is 20% off list price

<u>Sug. Price</u>	<u>\$Sale\$</u>	
\$12.95	\$10.35	<u>The Weather Wizard's 5-Year Weather Diary</u> Robert Alden Rubin edited and compiled this fact-filled book as a handy way to record the weather. Compare daily entries. Facts & charts. 374 pgs. spiral.
\$18.00	\$14.40	<u>The Audubon Society Field Guide to N.A. Weather</u> David Ludlum - Guide to observing and forecasting 350+ photos of natural phenomena. 640 pgs. paper.
\$11.95	\$ 9.35	<u>Volunteer Vacations 4th Ed.</u> Bill McMillon 190 organizations sponsoring over 2,000 expeditions; 5 cross-referenced indexes. 376 pgs. paper.
\$16.95	\$13.55	<u>Environmental Vacations 2nd Ed.</u> Stephanie Ocko What's available, how to contact coordinating organizations, what to expect. 248 pgs. paper.
\$18. 95	\$15.15	<u>Indian America 3rd Ed.</u> Eagle/Walking Turtle How & where to find over 300 Indian tribes in the U.S. - visitor info., public ceremonies, proper etiquette, traditional art & history. 424 pgs. paper.
\$16.95	\$13.55	<u>South America's National Parks</u> - Bill Leitch 7 countries are represented in this guide. 336 pgs. paper.
\$15.00	\$12.00	<u>Adventuring in East Africa</u> - The Sierra Club Travel Guide to the Great Safaris of Kenya, Tanzania, Rwanda, Eastern Zaire and Uganda - Allen Bechky 464 pgs. paper.
\$16.00	\$12.80	<u>Guide to the National Wildlife Refuges</u> - Laura & William Riley. Revised & expanded - 540 maps - new refuges, changes & closings. 672 pgs. paper.
\$18.95	\$15.15	<u>The Essential Guide to Hiking in the United States</u> Charles Cook - all major trails and hiking areas including national and state parks, forests and preserves - hiking clubs, info. & maps. 256 pgs. paper.
		<u>Sierra Club Guides to the National Parks</u> - paperbacks Maps, facility charts, phone #s, hours, etc. 270-400 pgs.
\$14.95	\$11.95	East and Middle West
\$18.95	\$15.15	Desert Southwest <u>OR</u> Pacific Northwest and Alaska <u>OR</u> Pacific Southwest and Hawaii <u>OR</u> Rocky Mountains

Previous books offered are still available, some with price increases. Call (203) 576-8126 and ask for Jeanne Yuckienuz to get price update. TO ORDER: List the books you want along with you name and complete mailing address. Include shipping fee of \$2 for the first book and \$1 for each additional book. Make checks or money orders payable to "AAZK Book Sale" (U.S. Funds Only - no cash or CODs, please). Mail order to: AAZK Book Sale, attn: Jean Yuckienuz, Beardsley Zoo, 1875 Noble Ave., Bridgeport, CT 06610-1600.





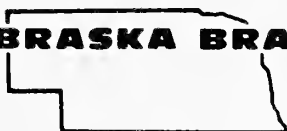
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Diet Notebook Survey

The Diet Notebook Committee is currently trying to complete the remaining volumes of the Diet Notebook series. The new volumes will include: Mammals, Volume II; Birds' Reptiles & Amphibians; and Fish & Invertebrates. With the survey below we are interested in finding out who is using the first volume and are soliciting any suggestions for improvements for the new volumes. Several changes are already being made for the upcoming volumes.

If your zoo has not previously submitted diets or would like to submit updated diets, please contact me for the proper forms.

Send survey and/or requests for diet forms to:

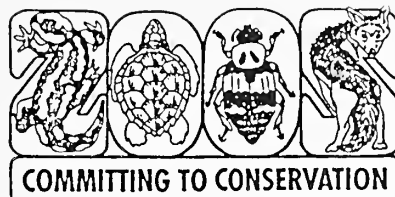


Susan Bunn Spencer, M.S.
8336 Courtland Drive NE
Rockford, MI 49341

- 1) Please list your title or position at your facility (keeper, curator, etc.)
- 2) Have you ever used the *AAZK Diet Notebook, Mammals, Vol. I*? **YES NO**
- 3) Does your zoo have a copy? **YES NO**
- 4) If yes, is the zoo's copy readily available? **YES NO**
- 5) Do you have a personal copy of the *AAZK Diet Notebook, Mammals, Vol. I*?
YES NO
- 6) Who formulates the animals' diets at your zoo?
- 7) If any, what changes would you like to see in the upcoming volumes?
(If you need more room, please attach a separate sheet of paper)



"Zoos: COMMITTING TO Conservation" Scheduled Speakers Announced



THE COLUMBUS ZOO • JULY 13 - 16, 1995

Following is a list of speakers, not all inclusive, for the upcoming conference "Zoos: Committing to Conservation" hosted by the Columbus Zoo from 13-16 July 1995. This Conference is intended to bring together interested zoo personnel with field researchers to discuss on-going projects and how we can become involved, either individually or through organizations. It will be a great opportunity to meet one on one with researchers to gather and exchange information.

Registration is \$115.00 (through 1 July 1995) and includes the ice breaker, all lunches and dinners. The Conference schedule also includes a trip to the Columbus Zoo, a live auction, and evening social events. For further information and/or registration forms please contact either Beth Armstrong or Beth Pohl, The Columbus Zoo, 9990 Riverside Dr., P.O. Box 400, Powell, OH 43065-0440 (614) 645-3426.

Speakers Scheduled for Friday, 14 July:

Jack Hanna, Director Emeritus-Columbus Zoo; Michael Robinson, Director-National Zoo; Karen Allen (consultant) "Cultural Sensitivity and Conservation"; Michael Hutchins (Director, Conservation and Science-AZA) "Beyond Noah's Ark: The Evolving Role of Modern Zoos and Aquariums in Field Conservation"; Catherine Tompson (Baltimore Zoo) "Village Banks Provide a Helping Hand, Not a Hand-out"; Susie Ellis (Conservation Breeding Specialist Group) "Out of the Zoo and Into the Field: Captive Technology and the Conservation of Threatened Species"; Charlene Jendry (Columbus Zoo) "Conservation Programming on a Shoestring Budget: the People Connection"; Russell Mittermeier (Conservation International); Norman Gershenz (Center for Ecosystem Survival) "Saving Wildlife in Nature: Successful Partnerships for *In-situ* Conservation"; Vernon Kisling (Earthwatch) "Field Research for Zoos and Aquariums: The Earthwatch Option"; Dianne Gates (Perth Zoo, Australia) "The Silvery Gibbon Project"; David Ross (Ohio Dept. of Natural Resources) "Conservation of Rare Species in Ohio"; Oscar Murga (Arcas-Guatemala C.A.) "Conservation Efforts in Guatemala by a Small NGO".

Speakers Scheduled for Saturday, 15 July:

Michael "Nick" Nichols (National Geographic); Bill Konstant (Philadelphia Zoo) "Building a Conservation Program from the Ground Up"; Valerie Koelle (Philadelphia Zoo) "Fundraising Strategies for Conservation"; Heidi Jamieson (Philadelphia Zoo) "Global Conservation Education: People Are The Key"; Gay Reinartz (Zoological Society of Milwaukee) "Finding a Niche in Field Conservation: The Evolution of a Zoological Society Program".

Speakers Scheduled for Sunday, 16 July:

Mark Plotkin (Conservation International); Eva Lee Sargent (ZCOG) "A High Impact, Low Cost Commitment: The Zoo Conservation Outreach Group"; Robert Klemm (Sunset Zoo, Manhattan, KS) "Genesis of a Fig: Serendipity in Action"; Natasha Schischakin (Houston Zoo) "Long-term Conservation Impact Through Infrastructure Support: The Brazil Fauna Interest Group Example"; Amy Camacho de Gabriel (Puebla, Mexico) "*In-situ* Conservation Projects at African Safari in Puebla"; Robert Horwich (Community Conservation Consultants) "Adopt a Community Sanctuary"; Tony Vecchio (Director, Roger Williams Park Zoo, Providence, RI) "The Role of Small Zoos in Field Conservation"; Joanne Luyster (Louisville Zoo) "The Black-footed Ferret (*Mustela nigripes*) Recovery Program: A Successful Rewarding Zoo Conservation Project"; Mark Chandler (New England Aquarium) "*In-situ* Conservation Efforts on Endemic Fish Biodiversity in the Lake Victoria Basin, East Africa"; Doug Warmolts (Columbus Zoo) "Aquatic Conservation Efforts at the Columbus Zoo: A Role for the Zoo Aquarium".



Chapter News

Dallas AAZK Chapter

New officers for 1995 are:

President.....Linda King
Vice President.....Denise Wagner
Secretary.....Rhonda Hampton
Treasurer.....Aimee Early
Liaison.....Ann Stevens

Thanks to last year's officers: Jan Steele, Linda King and Lisa Fitzgerald. They did a great job of keeping morale up and the Chapter rolling!

Thanks to Cynthia Bennett, our Research Zoologist, we had the Send Annual Book Swap, with money raised going to the Chapter's Enrichment Fund. The Chapter meeting on 17 March was a Leprechaun Lunch. Heidi Wester won the "Jan Steele Memorial Greenness Award" with her "Greenies" -- brownies in disguise.

This year's Bowling for Rhinos was held 24 May. A lap computer was donated for the coinciding silent auction at the bowling alley. The event was again tied into Indy's (our young black rhino) birthday. Plans for our 2nd Annual Zoo Olympics have been started as well as plans for a Chapter garage sale to supplement funds for this year's recipients of our Conservation fund. It will be split between The Wolf Reintroduction Fund and the Tamatan Zoo in Victoria, Mexico.

Work continues on finishing our dry marker Keeper Information signs so they'll be up for the summer crowds. "Chimp Chatter" has been up since fall and has been very useful in explaining special, day-to-day, aspects of our chimps' lives. We are also presently organizing a keeper exchange. If anyone is interested in coming here, please give us a call.

--Ann Stevens, Chapter Liaison



Information Please

The Bergen County Zoo has recently acquired 1.2 7-month-old Southern flying squirrels (*Glaucomys volans*). The animals were previously kept as pets, and as such are handleable and will eventually be used in our education programs. As we have never kept this species before, we would appreciate **any** information available, including information pertaining to husbandry, nutrition, and breeding. Replies may be sent to: Cindy Norton, Animal Health Technician, Bergen County Zoo, 216 Forest Avenue, Paramus, NJ 07652; Phone (201) 262-3771; FAX (201) 986-1788.

1) We are setting up a pair of Abyssinian ground hornbills (*Bucorvus abyssinicus*) for breeding and we are seeking information about housing, diet, pair bonding and nest box construction. We are interested in both successes and failures.

2) We are looking for ideas about nests and nesting material for Marabou storks (*Leptoptilos crumeniferous*).

Please send information, suggestions, ideas, stories to: Rob Boyle, Bird Dept., African Lion Safari, R.R. #1, Cambridge, Ontario, Canada N1R 5S2. Tel: (519) 623-2620; Fax: (519) 623-9542.

Riverbanks Zoo keepers are seeking advice on training a group of 2.3 Hamadryas baboons (*Papio hamadryas*), one of which is diabetic. Training methods, sample collection, and bridging techniques are requested. Also, any literature on diabetes in baboons or other primates would be greatly appreciated. Please contact John Davis, Sr. keeper/Cat & Bear area, Riverbanks Zoo & Botanical Gardens, 500 Wildlife Parkway, Columbia, SC 29210; Phone: (803) 779-8717 Ext. 169 or FAX (803) 256-6463.

We are wanting to collect recipes of concoctions used by keepers for animal treats, etc. Send to either: Michelle Acuña, 5025 N. 1st. Ave. #410, Tucson, AZ 85718 or Daniela Artner, 1105 S. Barrington Ave., #4, Los Angeles, CA 90049.

Seeking information on the proper care of Senegal Bushbabies (*Galago senegalensis*); environmental conditions, feeding requirements, etc. I am especially interested in helpful breeding tips and what husbandry techniques were used to lead to its success. Please send any information to: Sue Parisien, Arkhaven Animals, 81 Beaverbrook Lane, Kanata, Ontario K2K 1L7 Canada.



Bowling For Rhinos Update

from Patty Pearthree, BFR Coordinator
Indianapolis Zoo, Indianapolis, IN



Nineteen-ninety-five fundraising efforts will continue to send the first \$100,000.00 to Ngare Sergoi in Kenya (now Lewa Wildlife Conservancy - L.W.C.) and the rest to Ujung Kulon National Park in Java, Indonesia. Funding for Ngare Sergoi (L.W.C.) will continue to support conservation education, purchase replacement vehicles, translocation of additional rhinos into the sanctuary, increased security patrols and equipment. Funding for Ujung Kulon will be used to build a new guard post at the western tip of Java and a new security patrol boat (the best mode of transportation around the park).

I will be completing an internship this summer from 15 May-10 August in Kenya. All BFR needs or questions should be addressed to Herbie Pearthree at the same address and phone as before (P.O. Box 199026, Indianapolis, IN 46219-9026 or call (317) 322-8723). As of the writing of this update on 10 May, 44 Chapters or institutions have committed to holding an event in 1995.

- Remember, to be a trip winner, all money must be received by me no later than 1 September and you must be a National AAZK member in good standing. I also need to receive all contributions as early as possible to include them in the Conference report and include them in this year's (1995) donations.
- Please be sure to write "For Deposit Only" on the back side signature area of any checks sent to me through the mail! This will prevent anyone besides AAZK, Inc. from being able to cash the check.

You can raise money for "Bowling for Rhinos" through a bowling event, but there are several other ways to raise money. Some ideas include "Run for Rhinos", "Rock n' For Rhinos", "Rummage for Rhinos", or donations. Any way money is raised and sent to BFR, 100% goes directly to the two areas of conservation. Any amount of contribution is welcome! Good luck with all your events in 1995!

Word from Anna Merz, founder of Ngare Sergoi, is that Samia, the black rhino that Anna hand-raised, had a baby boy named Samuel on 11 April and is being a great mom! I hope to have more info for the conference and hope to be able to send a report from the field.

One example of a fundraising event as a alternative to a bowling event was sent in by the Lincoln Park Zoo AAZK Chapter. They held a musical/dance benefit for The Black Rhino Foundation, Inc. with proceeds going to the Ngare Sergoi/Lewa Downs Conservancy. Held in cooperation with 93XRT Radio Chicago, the event was held on 8 June with the \$30 advance tickets available through Ticketmaster. Tickets at the door sold for \$35. Guest musicians were Lowen & Navarro with special guest Peat Moss. Thanks to Cynthia Susher for this item. We will look forward to a report on how the event went and on monies raised. 🍏



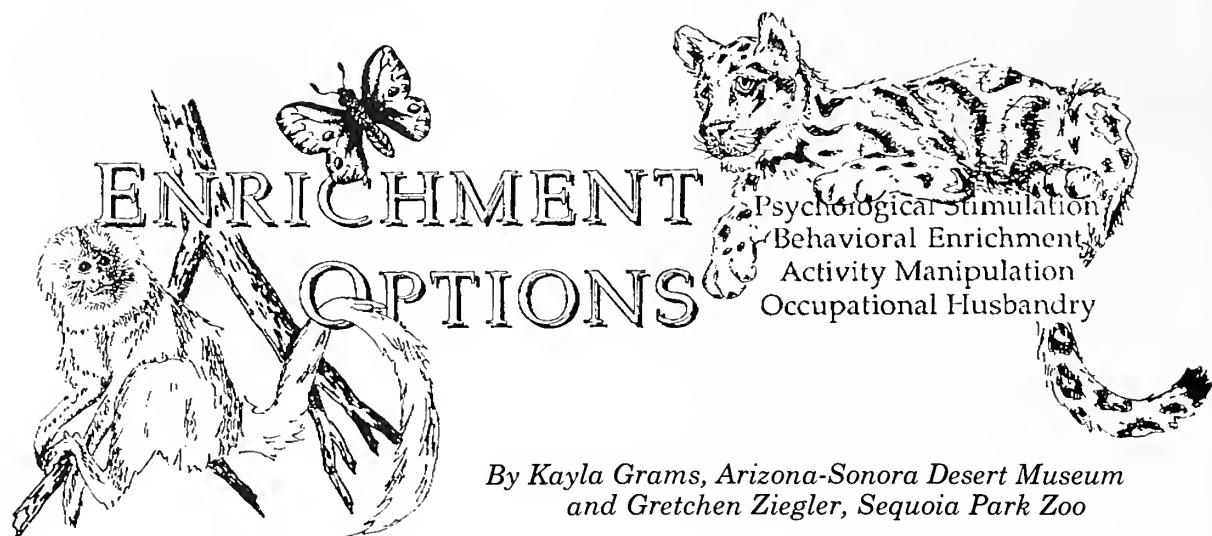
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**BENEFIT
FOR THE
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FOUNDATION, INC.





By Kayla Grams, Arizona-Sonora Desert Museum
and Gretchen Ziegler, Sequoia Park Zoo

This month's column features information about companies that manufacture/supply hard-to-find enrichment items. Many of these companies offer free catalogs with a phone call. It could be beneficial to collect such information to have on hand for that rainy day when your local Chapter donates all its bake sale income for the year towards enrichment supplies, or that strange but lovable weekly zoo patron wins the lottery and wants to buy something fun for the animals, or your curator suddenly discovers an entire unspent line item in the budget at the end of the fiscal year and wants YOU to decide how it should be spent. It could happen...

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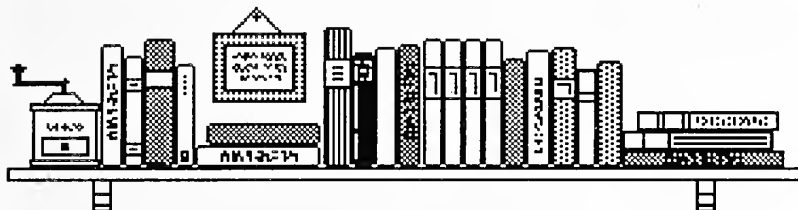
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Enrichment Options, Continued

If you know of other companies that supply items appropriate for enrichment, please let us know about them. We'd like to run an expanded list in the near future, and we know there are other resources and products available. And, as always, we still need your enrichment ideas to keep this column going. Take a look at what you're doing from day to day, and just take a minute to jot down your activities, including how effective (or ineffective) each idea was, and send it to us. Urge other keepers on staff to do the same. *Pictures* of the enrichment in progress are especially appreciated! Do it this week!

(Editor's note: Listing of these companies and their products does not imply endorsement on the part of *Animal Keepers' Forum* or AAZK, Inc. This listing is presented only as an informational service of this publication.)



BOOK REVIEWS

Wild Love

By Nan Richardson and Catherine Chermayeff
Umbra Editions, Inc., 1994
145 Avenue of the Americas, N Y, NY 10013
80 pgs. hardback \$14.95

Review by Nell Ball
House Guide, National Zoo
Washington, DC

From the very beginning of life, each new species has struggled to find and hold its niche. Competition from other life forms and extremes of change in the environment had led to the appearance of unknown numbers of adaptations directed towards the survival of their producers. Since the survival of any life form obviously depends upon its success in producing new generations, it is not surprising that there is enormous diversity in methods of courtship and reproduction.

In their book Wild Love, Richardson and Chermayeff have reviewed some of the ways in which a variety of animals court and mate. It is well written, interesting and the photographs are superb. About half of the species mentioned are mammals; however, the authors also included birds, fish, reptiles, amphibians, invertebrates and some plants. While the mating habits of lions, wolves and frogs are generally well known, there may still be some surprises. I am unaware, for example, that female frogs occasionally die of asphyxiation, overcome by the sheer weight of the numbers of males seeking to fertilize the female's eggs.

It was the breeding behavior of some less familiar species that I found most interesting, if not bizarre. For instance, in the authors' words - "a rhumba line of snails---male, female, male, female--each releasing a speculum amoris (love dart), a chalky, spearlike substance that pierces another's skin". There is an ironic situation with the platypus. The males have venomous spines on their hind legs, intended as protection against rival males. These spines are active during breeding season only, thus presenting a danger to careless females which may accidentally come in contact with the spines while breeding.

Overall, I would recommend this book. It is easy to read, well illustrated and judging by the acknowledgments, highly accurate.

Care of the Wild: First Aid for Wild Creatures

By William J. Jordon and John Hughes
The University of Wisconsin Press, 1992
114 North Murray St., Madison, WI 53715
225 pgs. paperback \$11.95

*Review by Bonnie L. Brown, Docent
National Zoological Park
Washington, DC*

You may accidentally strike a bird with the car. It drops to the ground, feathers awry, beak open, eyes closed, but it is still breathing. What do you do? Treat it for shock--but how? Take it to some animal hospital--but where? Should it be put to sleep to end its suffering? How can you make that judgment?

Of course, there are no easy answers when lives, even tiny feathered ones, are threatened but Care of the Wild should be of value to both experienced wildlife rehabilitators and those who wish only to provide temporary assistance to wild patients until professional custody can be arranged.

Written for American readers by internationally respected British experts in the veterinary care of wildlife, Care of the Wild gives simple, sound, straightforward information on how to deal with wildlife casualties. Sensitive subjects are dealt with realistically, yet the book has an underlying gentle humor that makes it a delight to read.

Using line drawings that complement the text, the book covers North American birds and mammals in detail and includes sections on reptiles, amphibians, and fish as well as discussions on insects and parasites. It also contains some outdated but generally useful appendices on wildlife laws and regulations, US wildlife rehabilitation centers, the composition of animal milks, and euthanasia.

Combining compassion for animals with facts and common sense, the authors describe the basics of simple diagnosis and animal first aid; methods of approaching, capturing, handling and transporting wildlife as well as information on treating, feeding, and temporarily housing wild patients. Instructions on the care of orphans is also provided. Treatments are suggested for injuries resulting from poisoning, trapping, hunting, contamination ination, and a variety of accidents.

The authors advise readers to check with authorities since some state and local regulations may forbid the keeping of many species of releasable wildlife, some may require a license for an unreleaseable animal to be kept, and others allow only licensed rehabilitators to take wild animals into care in the first place.

Possible animal handling hazards are identified, from the oft repeated warning, "no bird should ever be held near the handler's face" to the casually stated "squirrel bites are not to be underestimated".

Many practical hints are provided. These include a suggestion to walk slowly sideways to safety and successfully approach and capture waterfowl, a caution against the wearing of perfume "which can be offensive to sensitive nostrils and thus place the wearer at an initial and unnecessary disadvantage", and a firm admonition to exercise restraint before "toting home" apparent orphans. The authors also point out that eyes which look directly forward, as human eyes do, are generally recognized in nature as those of a predator and are likely to cause fear and panic. They, therefore, suggest cultivation of the habit of not looking directly at an animal to lessen its innate fear.

The book also contains interesting comments on a variety of subjects from the "breathtaking recruitment rate" of rats and mice to the problems caused by the "excessive feeding of white bread" to waterfowl.

In short, although it was originally published in the 1980s (reprinted in 1992) and could use some updating, Care of the Wild should be a useful reference to anyone who cares about the suffering of injured and orphaned wildlife.



Legislative Update

Compiled by Georgann B. Johnston
Legislative Advisor
Sacramento, CA



I have just taken over the job of writing this column for the *Animal Keepers' Forum* and would like to introduce myself and ask for input. My zoo experience comes from two years of work as a volunteer keeper at the Sacramento Zoo in California where I worked in all of the areas of the collection which includes over 300 mammals, birds and reptiles. I am also an attorney by profession, and was a librarian before that, so I have some background in research generally and the research of pending legislation in particular. In addition to the above, I rehabilitate raptors, bats, and small mammals at home through three local wildlife rescue organizations. While I have many sources available to me to keep up with legislation, I can always use input from members. You can e-mail me at gbatty@ix.netcom.com or send regular mail to 6333 Garden Hwy., Sacramento, CA 95837. I am looking forward to providing this service to the AAZK and if you let me know what sort of information is helpful to you or of particular interest, I will try to include it in future columns.

Museum Services Bill Proposed

On 12 April 1995, U.S. Congressman Williams introduced a bill, H.R. 1520, to amend the national Foundation on the Arts and the Humanities Act of 1995. The bill, cited as the 1% for Culture Act of 1995 and/or the {Arts, Humanities, and Museums Act of 1995, proposes to encourage promotion of the arts and humanities throughout the country. The bill contains a specific provision for the establishment of an Institute of Museum Services, which would oversee the distribution of federal money, on a state-by-state basis, for the creation, maintenance, expansion and overall development of museums and zoological parks.

The author's purpose is stated in the introductory paragraph of the bill: "The encouragement and support of national progress and scholarship in the humanities and the arts, while primarily a matter for private and local initiative, are also appropriate matters of concern to the Federal Government. An advanced civilization must not limit its efforts to science and technology alone but must give full value and support to the other great branches of scholarly and cultural activity in order to achieve a better understanding of the past, a better analysis of the present, and a better view of the future."

The initial draft of the bill proposes the distribution of approximately \$200,000.00 annually to each state and U.S. territory to achieve the goal of the Act. The money would then be administered by an appropriate state agency/organization for further distribution to various projects and entities within the state boundaries.

Source: Lexis/Nexis Pending Federal Bill File, 4/27/95

Goliath Frog Added to ESA

The U.S. Fish and Wildlife Service has designated Central Africa's goliath frog (*Conraua goliath*) as a "threatened species" under the Endangered Species Act. The goliath frog is the world's largest frog, weighing up to 7.2 lbs. and is found along major rivers in parts of Equatorial Guinea, Gabon and Cameroon. Grounds for determining its threatened status included its small range and "vulnerability to human exploitation and environmental disruption." The frogs' habitat is being destroyed by logging, deforestation and the construction of dams coupled with expanding human populations.

While export of the frogs has been banned by Cameroon since 1991, some still find their way into the U.S. where they sell for \$600-\$2500. The USFWS has stated that it will issue permits to import the frogs for "scientific purposes, to enhance propagation or survival, and for zoological exhibition."

Source: *African Wildlife Update* March/April 1995

Rhino and Tiger Conservation Fund Update

A follow-up report from *African Wildlife Update* states that the \$100,000.00 promised for rhino and tiger conservation projects has become available to the USFWS, "but to date no projects have been funded." A spokesperson for the Service, Marshall Jones, Assistant Director of International Affairs, said that some part of the money might be allotted for travel expenses incurred by a U.S. delegation which visited Taiwan in March and for implementation of a new U.S./South Africa Binational Commission which has the goal of "supporting South Africa's successful wildlife management as a model of sustainable development of wildlife resources for the rest of Africa."

According to legislation passed in 1994, the Rhino and Tiger Conservation Fund can receive up to \$10 million each year from the federal coffers, but current requests from the Clinton administration total just \$400,000. The distribution of funds is not mandatory and must be appropriated by Congress from federal funds as part of the 1996 fiscal year budget process.

Source: African Wildlife Update March/April 1995

ESA Species Listing Moratorium

The U.S. Congress decided in principle in early March this year to impose a moratorium on adding species to the federal endangered species list pending amendment of the Endangered Species Act. The bill also prohibits new critical habitat designations for species already declared endangered. Details on the moratorium are still being worked out in conference committee and will have to be voted on again by the entire House and Senate before the matter can become law.

Source: Animal People, April 1995

Public Comment Sought on Manatee Recovery Plan

The Florida Manatee Recovery Plan, currently being drafted by the U.S. Fish & Wildlife Service, is in its second revision and the Service is soliciting public comments. Manatees have been protected since the eighteenth century when England declared Florida to be a manatee sanctuary; Florida adopted the manatee protection law in 1893.

The two biggest threats to the manatee today are an overall decrease in its habitat and death from boats, with an average of two manatees a week dying in watercraft-related accidents.

The Recovery Plan addresses both the habitat problem and the recreational boating dilemma. Copies of the second revision may be obtained from David J. Wesley, Field Supervisor, USFWS, 6620 Southpoint Drive S., Suite 310, Jacksonville, FL 32216. (904) 232-2580.

Source: Animal People, May 1995

Alaska Proposes Wolf Bounty

Alaska's legislature is considering a bill, introduced by Senate Republican Bert Sharp, which will put a \$200 bounty on wolves on the theory that they are predators of caribou, moose, and other big game that are targets for hunters. Steve Wells, a spokesperson for the Alaska Wildlife Alliance, stated that it is likely that this bill will pass. Alaska's Governor Tony Knowles, who canceled a state-sponsored wolf-control program last year after the Department of Public Safety issued a report showing that the program had been mismanaged, is opposed to the bounty bill. Governor Knowles has the power to veto the bill should it pass out of the legislature and comments regarding the matter may be addressed to him at P.O. Box 110001, Juneau, AK 99811-0001.

Source: Defenders of Wildlife's Wildlife Advocate, Winter 1995

Wetlands Report Argues Against House Bill

One day before the House was to begin debate on a bill that would greatly reduce federal protection for the nation's wetlands, the National Academy of Sciences published an authoritative report to Congress that repudiates the basic approach taken by the bill. The bill would require that any protected wetland must match a strict set of defining criteria involving water saturation, soil chemistry, vegetation and similar measurements. But the new report rejects these criteria, which critics say would remove federal limits on development from most of the nation's remaining wetlands.

One criterion set forth in the bill would require land to have 21 days of consecutive surface water during the growing season to be protected as wetland. The Environmental Protection Agency and the Association of State Wetland Managers estimate that such a criterion would reduce America's protected wetlands by 50-80 percent. The bill would also attempt to rank wetlands in order of ecological value, protecting only the ones that provide the most important functions like wildlife habitat, flood control and filtering pollution. Over the decades, wetlands have dwindled steadily and now total about 100 million acres, not counting those in Alaska.

The 268-page report, commissioned two years ago by Congress, and put together by a panel of 17 prominent wetlands experts concludes that scientists simply do not know enough about wetlands to be setting up arbitrary criteria for their continued protection.

Source: The New York Times, Tuesday, May 9, 1995



Dreher Park Zoo Staff to Work in Amazon Cloud Forest

This summer, Dreher Park Zoo staff and Nova Southeastern University students will travel to Baños, Ecuador high in the Andes mountains where they will work with Baños' San Martin Eco-Zoológico. During the three, one-week trips, hardy vacationers will travel with the groups to volunteer their efforts with the Baños Zoo through routine tasks including painting, signage, exhibit maintenance and horticultural work. The Zoo staff, university students and "working vacationers" will be joined by travel journalists and photographers who will document the group's efforts.

Known as the Biodiversity Project, this effort is comprised of many components. Dreher Park Zoo staff will begin training the Baños Zoo staff in modern zoo philosophies and animal care. The two zoo' staff will work together developing all aspects of zoo and animal management, including an Animal Behavioral Enrichment program for the resident animals of the Baños Zoo. Dreher Park Zoo staff will also establish its own research programs studying the behaviors of species found in that area.

"We are excited to be part of this developing project," said Dreher Zoo Director Robert Callahan. "American zoos are increasingly turning their attentions toward including international zoos in the worldwide efforts of education and wildlife preservation."

The primary focus of this Biodiversity Project is to assist the San Martin Eco-Zoológico in its own mission of education, conservation, and injured wildlife rescue and rehabilitation. Baños is located about four hours' drive from Quito, the capital of Ecuador. The San Martin Eco-Zoológico is built into the sides of a canyon, and houses many of the same South American species found at Dreher Park.

The first two week-long trips are scheduled for this month. The final trip will be August 14-21. Cost of the 8-day project is \$1450 per person, double occupancy, and includes round-trip airfare from Miami to Quito, all ground transportation, breakfasts and dinners in the field, 2 nights' lodging in Quito and lodging in Baños. Additional weeks cost \$50 per day. Not included are lunches, personal items, departure taxes, and airline taxes. For further information, call Dr. Barry Barker, Nova Southeastern University at (305) 452-5513 or (305) 463-2557.



1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

PRE- AND POST-CONFERENCE TRIPS

Pre-Conference Trip A: Friday, September 22

Visit Colorado Springs with a stop at the Garden of the Gods--hiking trails surrounded by unusual red sandstone rock formations. Next stop is Cheyenne Mountain Zoo, whose base elevation is 6,800 feet! Lunch will be followed by behind-the-scenes tours. We will return to the Executive Inn Hotel in Denver for dinner on your own. **Cost: \$20.00 per person**

Pre-Conference Trip B: Saturday, September 23

Join us for a morning ride on the Cog Railway up 14,110 feet to Pikes Peak Summit. Then return for lunch on your own in historic Manitou Springs, filled with charming shops and a variety of restaurants. Early afternoon we will travel to the Pueblo Zoo for behind-the-scenes tours. The staff of this interesting 25-acre zoo then invites us to join them for dinner at their zoo. We will return to the Executive Inn Hotel in Denver after dinner.

Cost: \$35.00 per person

Post-Conference Trip: Friday September 29 through Monday, October 2

Come stay with us at Big Thompson Timberline Lodge located near Rocky Mountain National Park and Estes Park village. We have reserved large 3-bedroom cabins that are fully furnished for all your needs. Activities planned include hiking tours of Rocky Mt. National Park; a scenic drive along Trail Ridge Road which is the world's highest continuous paved highway at 12,000 feet; a tour of the Stanley Hotel where "The Shining" was filmed; plus lots of relaxation and hot tubbing! An optional horseback riding tour, lasting at least two hours, through the secluded trails of the Rocky Mt. Nat'l Park is also available at an additional cost. Please note: We will be returning to the Denver area by approximately 2:00 p.m. on Monday, October 2.

**Cost is \$150.00 per person
Additional horseback tour
is \$30.00**



Reservations for all Pre- and Post-Conference trips must be received by 1 August 1995. Due to the need to finalize our arrangements, we cannot accept any reservations after this date.

For more information about either the Pre- or Post-Conference trips please contact:

Linelle Lone (303) 331-5843 or (303) 320-1106

1995 AAZK National Conference Denver, Colorado September 24-28, 1995



FINAL CALL FOR PAPERS

Plan now to share your knowledge with your fellow keepers. This year's topic is "Habitat Destruction, Creation and Conservation - in Captivity and the Wild". **DEADLINE for submissions is 1 July 1995.** Papers, poster sessions and workshops are invited.

- Papers will be limited to 15 minutes followed by 5 minutes of questions.
- Workshop sessions will be provided for programs, discussions and debates.

Please submit a short abstract for all proposed papers, poster sessions or workshops. Abstracts should include the name of presenter, presenter's job title, zoo affiliation, title of paper, proposed format (paper, workshop or poster), and equipment needed for presentation (slide projector, VCR, overhead projector, etc.)

Send abstracts to:
Todd Cleveland, 1995 AAZK Conference
Denver Zoo, City Park
Denver, CO 80205-4899

Additional Conference Notes

- ☐ Post-Conference is to Estes Park. Guests will be staying in log cabins located near the river. Amenities include washer/dryer, kitchenette, indoor plumbing, and a hot tub. Bring your swimsuit! **NOTE:** Post-Conference attendees should plan to make their flight departure reservations for **after 3:00 p.m.** on Monday, 2 October. Vans from Estes Park will be going directly to Denver International Airport with arrival there planned for 2:00 p.m. If you are staying over and wish to return to the hotel, vans will deliver you there following the DIA drop-off.
- ☐ If you are interested in presenting a Workshop, contact Linelle Lone at (303) 331-5843 or (303) 320-1106 for information.
- ☐ Exhibit tables are still available. They are 6 ft. long. Cost is \$15.00 for half a table; \$30.00 for a whole table. Deadline for reserving a space is **15 August 1995.** **NOTE:** The room will be locked each evening--security provided.
- ☐ There will be a VCR available in the Hospitality Suite. Please bring an entertaining or educational video or a video of your zoo. Past conference videos are also of interest.
- ☐ The Executive Towers is located in central downtown Denver. It's just a short bus ride away from the zoo. It is within walking distance of shopping, micro breweries, restaurants and night clubs. Public transportation is easily accessible.
- ☐ The optional Monday evening trip to Central City for a Casino Night will provide delegates with not only a chance to test Lady Luck, but also an opportunity to visit the unique shops of this restored western town. The \$10 fee includes buffet dinner, 2 drinks, a \$2.00 coupon for use in the casino gift shop, an ice cream cone and two Royal dollars at the Blackjack Table Match Play.

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

CONFERENCE REGISTRATION FORM

Name _____

Address _____

City _____ State/Province _____

Zip/Postal Code _____ Phone (____) _____

Zoo Affiliation _____ Position/Title _____

AAZK Chapter _____ AAZK Membership Status _____

Number of AAZK Conferences you have attended _____

AAZK Committee Member? _____

Presenting a Paper/Poster? (please circle) Yes _____ No _____

Title _____

Participating in Zoolympics? Yes _____ No _____

Bringing an Auction Item? Yes _____ No _____

Optional Activities: (extra charges involved)

Need table in Exhibitors Hall? Yes _____ No _____

Casino Trip on Monday night Yes _____ No _____

Pre-Conference Trip A Yes _____ No _____

Pre-Conference Trip B Yes _____ No _____

Post-Conference Trip Yes _____ No _____

Horseback riding on Post-Conf. Trip Yes _____ No _____

Vegetarian? Yes _____ No _____ What type? _____

T-Shirt? Yes _____ No _____ Size (L, XL) _____

Arrival Date and Time _____

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

CONFERENCE FEE SCHEDULE

AAZK Member	\$100.00*	_____
Member Spouse	\$100.00*	_____
Non-Member	\$110.00*	_____
Non-Member Spouse	\$110.00*	_____
Casino Trip Charge	\$ 10.00	_____
Exhibitors Table Fee # Tables _____ (\$30.00 full table, \$15.00 half table)		_____
Daily Fee (which day) _____ (See Day Rates Schedule on next page)		_____
Pre-Conference Trip A	\$ 20.00	_____
Pre-Conference Trip B	\$ 35.00	_____
Post-Conference Trip	\$150.00	_____
Horseback Riding on Post-Conf. Trip	\$ 30.00	_____
Late Fee (after August 1, 1995) (only for full conference, not for individual days; no reservations for Pre- or Post-Conference trips accepted after August 1.)	\$ 10.00	_____
TOTAL FEE ENCLOSED	\$	_____

*Fee includes a \$20.00 contribution to AAZK National.

*Fee does not include cost of Conference Proceedings.

Please make checks payable (in U.S. funds) to: "AAZK Conference 1995"

Send Registration form and all fees to:

Vickie Kunter
Rocky Mt. AAZK
Denver Zoo
2900 E. 23rd Ave.
Denver, Colorado 80205

1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995

HOTEL REGISTRATION FORM

Name _____

Address _____

City/State/Zip _____

Telephone _____

Rooms will be held after 6PM only if guaranteed with a major credit card. Once guaranteed, there will be no refund for cancellation.

Credit Cards accepted: VISA, MasterCard, American Express, Diner's Club

Name as it appears on card _____

Card Number _____ Expiration Date _____

ROOM RATES:

_____ 1 Double Bed \$88.00

_____ 2 Double Beds \$96.00

****Cots may be set up in rooms for an additional charge of \$10.00**

****Up to four (4) people may stay in one room**

Arrival Date and Time _____

Departure Date and Time _____

Hotel Check-in: 2:00 PM

Check-out: 12:00 noon

****Roommates are the responsibility of each registrant****

Parking is available at the hotel for a fee of \$7.00 per day.

To make reservations by phone, dial 1-800-525-6651

Please return this form to:

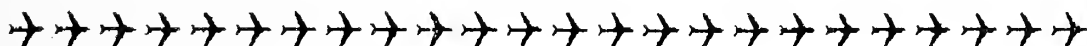
**Executive Tower Inn
1405 Curtis Street
Denver, CO 80202**

**Reservations MUST be made by 1 September 1995
in order to receive special Conference rates**

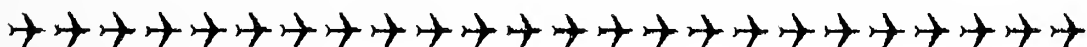
**1995 AAZK National Conference
Denver, Colorado
September 24-28, 1995**

For those individuals who will not be attending the entire conference, the following rates show the cost of daily registration or single events. These rates apply **ONLY** to those individuals who do not pay the full registration fee. If you have registered and paid for the full conference, all events listed below are included in that fee. (Excepted is the optional Casino trip, which is an extra charge for full conference attendees.)

Sunday, September 24 Cost: \$26.00	Open Board meeting Committee meetings Evening Event: Icebreaker at the Denver Museum of Natural History
Monday, September 25 Cost: \$21.00	Paper sessions Workshops AM Break and Lunch
Cost: \$10.00	Evening Event (optional): Casino Night in Central City. Includes buffet dinner, 2 drinks, \$2.00 coupon for use in casino gift shop, ice cream cone and two Royal dollars at the Blackjack Table Match Play.
Tuesday, September 26 Cost: \$21.50	Day at the Denver Zoo. Includes behind-the-scenes tours, workshops, lunch, Zoolympics and dinner.
Wednesday, September 27 Cost: \$30.00	Paper sessions Workshops AM Break and Awards Luncheon Tour of Rocky Mountain Arsenal Wildlife Refuge Evening Event: Silent Auction
Thursday, September 28 Cost: \$38.50	Paper sessions Workshops AM Break Tour of Rocky Mountain Arsenal Wildlife Refuge Evening Event: Final Banquet



United Airlines has been chosen as the Official Carrier for the 1995 AAZK National Conference. For further information on fares in the U.S. and Canada, call 1-800-521-4041. Use reference #590XM.



KOKO Speaks Out



excerpted in part from

E - The Environmental Magazine
Vol. VJ, No. 3, June 1995

She's an unlikely video star, a 23-year-old primate with an 800-word vocabulary who weighs 280 pounds and eats more than 30 pounds of fruits and vegetables a day. Yet Koko, a lowland gorilla (*Gorilla g. gorilla*) known throughout the world for her unusual ability to communicate with humans by sign language, recently made her first TV commercial. It's a public service announcement (PSA) aimed at raising funds for the Gorilla Foundation, a nonprofit research organization that currently cares for Koko, and two male gorillas, Michael and Ndume in Woodside, CA.

"There aren't any other endangered species that can represent themselves in that way," says Jon Steel, General Manager of Goodby, Silverstein & Partners, the San Francisco ad agency that put together the commercial. Steel, a member of the Gorilla Foundation, had the idea for the PSA after a visit to one of the last gorilla colonies in Rwanda.

Headed by Dr. Francine Patterson, a psychologist who began teaching Koko American Sign Language in 1972, the foundation plans to move next year to a 70-acre preserve in Maui, Hawaii. The move will enable Patterson and her associates to expand operations, which include monitoring the progress of gorillas around the world and conducting research on Koko, Michael (a former suitor who also uses sign language) and Ndume, her current suitor.

The new site will also provide a refuge for captive gorillas stressed out by zoo life, as well as wild gorillas whose lives have been disrupted by civil strife in Rwanda. According to Natasha Yankoffski, the foundation's administrative director, the Rwandan gorillas have been "very displaced" by the war and by human encroachment -- one gorilla died after stepping on a land mine. Mountain gorillas are on the brink of extinction - there are only 650 left in the world, mostly in Rwanda. Smaller lowland gorillas are more numerous with populations estimates at between 5,000-8,000.

Accompanied by tribal-sounding music and title cards, Koko's ad uses sign language to alert viewers to the plight of gorillas. "It's a pretty dramatic statement," Dr. Patterson says. "The message is coming from the animal we're trying to save, and that's never happened before." Koko was told that her work was "for the gorillas" and, according to Patterson, "She understands it the way a small child would."

The PSAs began running late last year on stations in California and Hawaii, and also has been made available to the major broadcast and cable networks. The two versions of the PSA, one 15 and one 30 seconds in length, each end with the toll-free-number 1-800-63-GO-APE where people can call for more information or to help out. "I hope it will raise public awareness even if people don't choose to donate," says Patterson.

For more information, interested persons may also write to: The Gorilla Foundation, P.O. Box 620-640, Woodside, CA 94062.



Training A Reindeer At Burnet Park Zoo

(The Rein of Elizabeth)

By Bernard Feldman, Keeper
Burnet Park Zoo, Syracuse, NY



A variety of animals at the Burnet Park Zoo in Syracuse, NY, have been trained for their physical and mental stimulation, behavioral enrichment, and education.

For example, the Newfoundland dog (*Canis familiaris*) has been trained for obedience demonstrations, the Guinea hog (*Sus scrofa*) demonstrates intelligence, obedience, and scent discrimination work. The Asian elephants (*Elephas maximus*) are trained for their physical and mental stimulation as well as education demonstrations.

In addition, a one and one half year old female reindeer (*Rangifer tarandus*) we have named "Elizabeth", was trained for enhancement of our holiday lights program, C.A.T.Z. (Celebration at the Zoo). Her training has been a slow and gentle conditioning process which started during August, 1994, with keepers desensitizing her to their presence.

When Elizabeth first arrived she kept her distance from us during the 30-day quarantine period. We frequently had to manually restrain her for physical examinations and related tests. Naturally, she'd react to our presence by immediately running away from us to the furthest part of her yard; nervously pacing back and forth.

After the quarantine was finished, the need to restrain her was over so she became less nervous and more curious about the keepers. When offered grain, she eventually allowed a keeper to gently touch her head and antlers. This was the beginning of the bonding process.

The gentle and calm attention she received proved to be the key to reassure her that it was OK to be touched and to have a keeper close by. This conditioning time lasted only a few minutes daily when grain was offered in the morning and continued for about four weeks.

The day finally came when we began the formal training sessions with Elizabeth. The training plan involved desensitizing her to new situations and people. It progressed when she was comfortable at certain points of her training and a breakthrough occurred. At this time, three keepers shared the work with her, two at a time. We kept a journal to record our progress or note any problems. Our goal was to have a reindeer visible during the holiday program, with minimal risk to the visitors, and minimal stress to the animal and the keepers.

While one keeper observed, the second keeper rubbed and petted her as we did earlier, then gently held her halter and attempted to start walking her in the yard adjacent to the reindeer barn. The moment Elizabeth sensed her halter was being held, her response was to run. The keeper held onto her halter and offered grain as reinforcement to reassure her and to encourage her to walk.

In a few days Elizabeth learned that a keeper's approach with grain was the beginning of another positive experience. She'd come to the keeper, begin eating and the training could start. Each session lasted from five minutes to half an hour, depending on her tolerance. Some days there were one or two sessions or as many as four, depending on our own schedules.

Training A Reindeer Burnet Park Zoo, Continued

As with every training session, there were certain breakthroughs that made the whole effort worthwhile. In this particular case it was the addition of a lead rope clipped onto Elizabeth's halter during the second week of formal training. Many times during the first week, Elizabeth reacted to her halter being held by slightly pulling back. When the lead rope was clipped on and she sensed that she could walk with some space between her and the keeper, her behavior greatly improved. She was considerably more at ease with her "limited freedom".



Author Bernard Feldman is shown walking Elizabeth on a lead rope. The addition of the lead rope to the training routine provided Elizabeth with a "limited freedom" which made her more at ease.

When we wanted Elizabeth to walk, we'd say "move up", hold on to her lead rope, begin walking, and show her the food. She would take a few steps, at which point we would say "good" while offering her the grain. After several steps we'd say "steady", stop walking, and give her a reward when she stopped. There were times, however, when she'd need the visual reminder of the food to encourage her to start walking. At the end of the training sessions when Elizabeth had responded well to our commands, we'd say "good girl" and offer her the rest of the grain.

At this point in her training she was truly a pleasure to work with. There were times when we would simply stand, she'd graze on some grass and we'd be at ease with each other.

During training there was a search for the best possible reinforcer. Grain was the first reinforcer used. Animal crackers were also tried but she would only mouth them. When bread was offered, she preferred it over anything else. Soon, simply the sight of the bread and calling her name would bring her to the keeper. She would allow herself to be caught and the training session would begin.

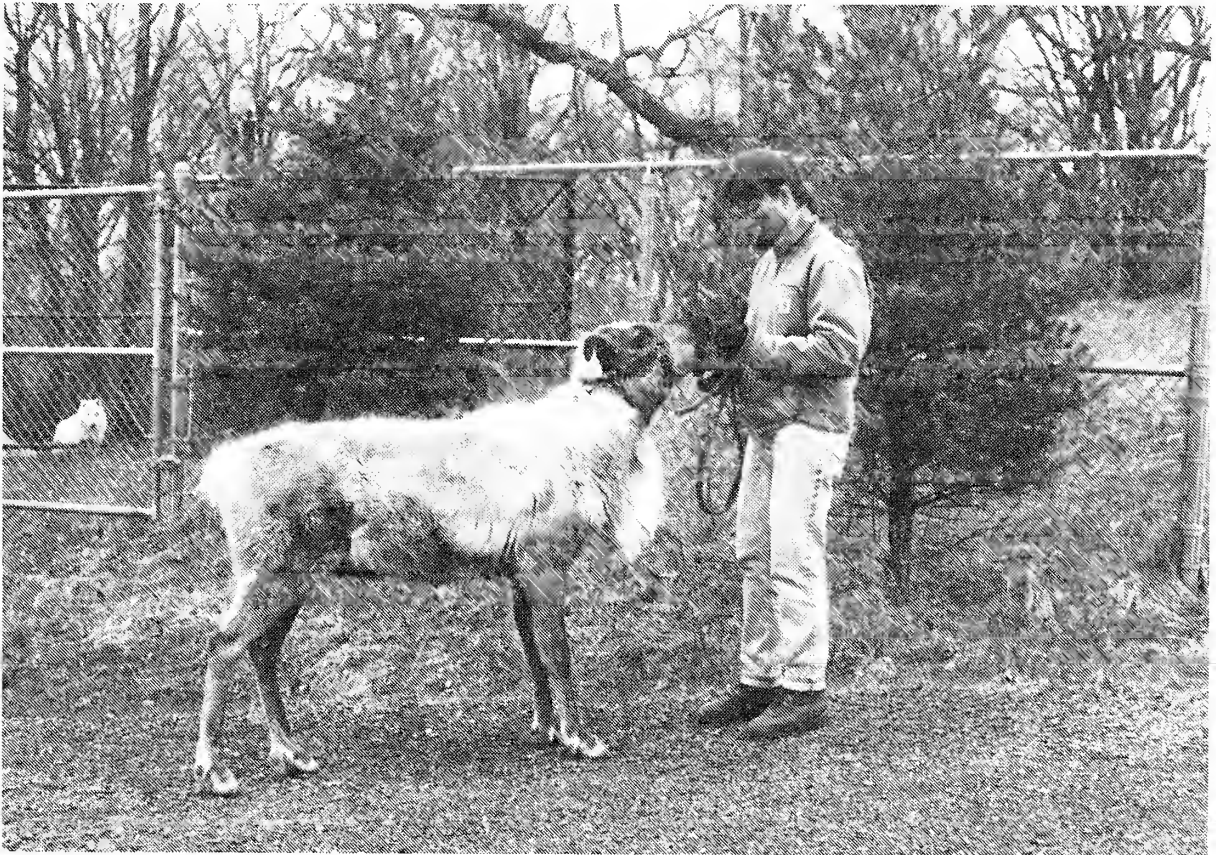
There were times when Elizabeth would become nervous about something during the session. She would circle the keeper until her fear passed and the session continued calmly. Many times when returning to her barn, she would be very excited about going back and would move faster. At those moments restraint and control were needed.

Training A Reindeer Burnet Park Zoo, Continued

The first week of Elizabeth's formal training involved three keepers working individually with her. As each keeper first started there was a slight regression on Elizabeth's part from what she had learned. She would be reluctant to come to the keeper to start the session or she would not walk much, if at all. The problem to overcome was desensitizing her to each new keeper when they began working with her.

In the third week of formal training, Elizabeth was walking very well. She would be hesitant only at the beginning of a training session when a new keeper started working with her, but soon walked well when the food reinforcement was offered.

The next problem to overcome was having two keepers at a time during the sessions. When both keepers approached her, Elizabeth was very reluctant to allow either of them to get close to her. It was apparent to us that this was a response to the earlier need for frequent restraint during her quarantine. To correct this problem, we decided to have one keeper first get Elizabeth on the lead rope. As the training session started, the other keeper would join them in order to desensitize Elizabeth to the presence of another person. She was very wary and would nervously circle in her yard. She'd calm down slowly and the training session would continue with both keepers. Soon she became more comfortable with more than one keeper at a time. There were now four keepers able to work well with her.



One of the challenges in the training of Elizabeth was getting her to respond to and be at ease with a number of different keepers. Above, Burnet Park Zoo Keeper Peg Louer rewards Elizabeth for appropriate training behavior.

At first, the training sessions were done throughout the day and restricted to the reindeer yards. In time they included the public areas of the zoo where Elizabeth would be part of the C.A.T.Z. program. These training sessions were done to further desensitize her to more people and new places. They were later in the day to acclimate her to the evening program and included three keepers. One keeper educated the visiting public about the training and maintained a safety zone, while another keeper cleaned up any waste. Elizabeth's reaction to the visitors was minimal.

A few weeks before the program began, we put a harness with bells on Elizabeth so she would become desensitized to it. She mostly tolerated the harness and allowed the keeper

Training A Reindeer Burnet Park Zoo, Continued

to secure it to her with a minimal amount of fuss. She would occasionally try to shake it off, but as the sessions progressed she shook less and accepted the harness.

As the time for C.A.T.Z. approached, we became confident that our training efforts were successful. Key points to the success in this training were good communication and critiques among the keepers, including the use of a journal; consistent training commands and cues, a gentle and calm approach to Elizabeth, the proper and consistent offering of the primary reinforcer (bread) after a desired behavior, and a progressive desensitizing of Elizabeth to more people and new situations.

Throughout C.A.T.Z., we all were pleased with Elizabeth's behavior. It is intensely gratifying to know that with our coordinated training program, our reindeer was changed from an untouchable and nervous animal to one that is quit calm around many people, flashing cameras, and excited children.

Elizabeth's training has been an enriching learning experience for her and her keepers. It demonstrates the capacity a wild animal has to interact positively with keepers, to become very easy to handle, and enjoyable to work with.

Acknowledgments

I am most grateful to Anne Baker, Ph.D., Zoo Director, Chuck Doyle, Curator of Mammals, and Charlotte Tagtmeyer, Zoo Keeper at the Burnet Park Zoo, for their careful editing, counseling, and the final formation of this paper. And a final 'Thanks' to all the volunteers who helped us with Elizabeth throughout C.A.T.Z.

Keeper/Author Bernard Feldman found that gentleness and patience played an important role in the training of 0.1 reindeer Elizabeth. Elizabeth was used for enhancement of the Burnet Park Zoo's Holiday Lights Program which is called Celebration At The Zoo (C.A.T.Z.). Her presence was also an educational one for zoo visitors, especially the children.



Photos provided by the author



Observation on Sloughing in Reticulated Python (*Python reticulates*)

By

*B. Rathinasabapathy and
V. Kalaiarasan, Research Assistants
Madras Snake Park Trust, Guindy, Madras, India*

Sloughing/molting is a recurring biological process in snakes. Its frequency is dependent on the particular species of snake, its general health and also the environmental conditions such as temperature and humidity (Bellaris, 1969). Incidents of molting in the Reticulated python (*Python reticulates*) were studied in Madras Snake Park Trust (MSPT), India, between July 1990 and July 1992. The particular snake studied was hatched at MSPT on 18 July 1990 and was observed during the two years with special regard to its shedding pattern. The python was kept in a wooden enclosure of 3 x 1 x 1.5m dimensions (9.8 ft. x 3.2 ft. x 4.9 ft.). One side of the cage was glass with the other sides being wood-framed wire mesh. The floor had sand, a few rough stones, and a water container.

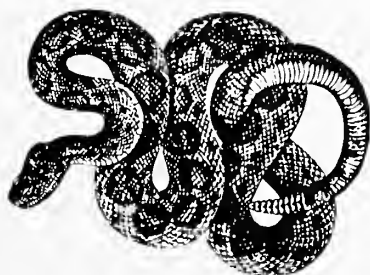
The snake was fed with munias (small birds), sparrows, domestically raised rats and chickens at intervals of 8-10 days. The first sloughing was recorded on the 5th day after hatching. The first feeding was on the 8th day of its young life.

The weight of the python was 115gms (4.1 oz.) when it consumed three munias. These weighed 43 g (1.5 oz.), or 42.50% of the body weight of the snake. During the snake's first year of life, food intake averaged 42.50% of its body weight. The number of sheds or sloughings during this one year period were 13. The food intake averaged 36.11% of the snake's body weight in the second year (a reduction of 7.39%). The snake shed ten times during its second year. It is not clear whether the decrease in the sloughing frequency is due to reduction in the intake of food, or a slower rate of growth due to the aging process.

Sloughing was highest during our winter, which is characterized by temperatures ranging from a minimum of 19.8° C to 23.8° C (67.64° F - 74.84° F) to a maximum of 28.7° C to 31.8° C (83.66° F - 89.24° F) and 600mm (approx. 24") of rainfall, when compared with other seasons. (Table 1). It is reported that the shedding frequency in snakes has some temperature dependency, which is independent of growth rates (Semlitsch, 1979; Staler, 1939 [In Naullean & Brule, 1981]) also states that molting is influenced more by temperature than food intake in a crotalid snake. It is also true in the case of Russel's viper (*Vipera russelli*) [Paulraj & Naidu, 1987]. However, both of the latter two examples represent snakes that are not closely related to pythons.

When it was in the sloughing process, the python refused to feed and struck vigorously if approached. During this period when the eyes become bluish and the outer layer of skin begins to loosen, the snake cannot see well and is easily alarmed. This particular snake was typically in-the-blue for eight days, before shedding. During the study period, the skin was typically shed in one piece. Soon after sloughing, the snake became active and resumed its normal activities including feeding.

This particular study revealed that most of the sloughing in this species occurs during our winter which is characterized in this part of India, on average, by 29°C (84.2° F) temperature, 85% humidity, and 600mm (approx. 24") of rainfall. This would suggest that sloughing frequency in snakes is perhaps determined by a combination of environmental factors as well as food intake.



Observation on Sloughing in Reticulated Pythons, Continued

Table.1 Details of sloughing in a reticulated python,
Python reticulatus.

Date of sloughing	Interval between subsequent sloughing (In days)	Season
15.07.1990	8	Monsoon
03.08.1990	19	Monsoon
16.08.1990	13	Monsoon
06.09.1990	21	Monsoon
12.10.1990	26	Winter
10.11.1990	39	Winter
07.12.1990	27	Winter
02.01.1991	24	Winter
05.02.1991	33	Winter
01.03.1991	24	Summer
10.04.1991	40	Summer
23.05.1991	43	Summer
07.07.1991	46	Monsoon
19.08.1991	32	Monsoon
16.09.1991	36	Monsoon
25.10.1991	39	Winter
21.11.1991	26	Winter
29.12.1991	38	Winter
25.01.1992	27	Winter
18.02.1992	23	Winter
30.03.1992	42	Summer
09.05.1992	40	Summer
15.06.1992	36	Summer
Mean X = 30.52 SD = 9.0		

Observation on Sloughing in Reticulated Pythons, Continued

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Early Developmental Chronology of a Matschie's tree kangaroo (*Dendrolagus matschiei*) Through Daily Standing Pouch Checks

by Maria C. Franke-Senior Keeper
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Introduction

The family of tree kangaroos *Dendrolagus* is a group of medium sized marsupials who are the only member of the macropodidae that have adapted to an arboreal life style (Olds and Collins, 1973 and Procter-Grey, 1990). Tree kangaroos are especially interesting to zoologists because of their evolutionary development. They are thought to have evolved from ground dwelling macropods who actually returned to the trees to take advantage of an abundant food source (Moeller, 1990 and Domico, 1993). Today, there are nine species of tree kangaroos which are confined to the rain forests of New Guinea and Northeastern Australia (Domico, 1993). Two of the biggest threats to the continued survival of tree kangaroos are hunting and habitat fragmentation. A number of zoos are beginning captive breeding programs in the hopes of saving these species from further decline (Domico, 1993).

The Matschie's tree kangaroo (*Dendrolagus matschiei*) is sometimes called the "Huon tree kangaroo". Native to New Guinea, they are found only on the mountainous Huon Peninsula and nearby Umbiyou Island (Domico, 1993). The Matschie's tree kangaroo appears to do better in captivity than other tree kangaroos, thus it is the most common tree kangaroo found in zoos world wide. Although several zoos have had good breeding success over the years, high mortality rates have hindered the overall expansion of the captive population (George, 1990). The Matschie's tree kangaroos are currently part of a Species Survival Plan (SSP) and are managed internationally through a studbook based at the Conservation and Research Center, Front Royal, Virginia (Domico, 1993). In North America the current captive population is at 70 (30.38.2) animals. The goal of the tree kangaroo SSP is to retain 90% genetic diversity for 20 years and increase the population to its carrying capacity of 124 animals at a growth rate of 10% per annum.

As for all marsupials, the tree kangaroo is born in an early developmental stage. At birth, it makes its way from the urogenital opening to the mother's pouch without the mother's assistance. In the pouch, attached to one of four teats, the single joey continues its development as if in a second womb (Procter-Grey, 1990 and Domico, 1993). Early developmental and demographic events in many marsupials occur in the mother's pouch and consequently in captivity, out of sight of animal keepers. Because pouch examination is perceived as being stressful to both animal and handler, there has been little information obtained on the early life history events in marsupials in zoos (Roberts and Kohn, 1991). To date, there have been some papers which have documented Matschie's tree kangaroo joey development (Olds and Collins, 1973; Heath et al. 1990; Dabek and Hutchins, 1990).

The Metropolitan Toronto Zoo has recently bred the Matschie's tree kangaroo for the first time. This paper will briefly discuss the breeding of Matschie's tree kangaroos and will concentrate on the training of a female tree kangaroo ("Emma"), who allowed keepers to perform daily standing pouch checks. A pouch check is defined as an event where an unrestrained female tree kangaroo allows a keeper to look into the pouch. These pouch checks allowed parturition and pouch gravidity to be determined, as well as early rates of growth and development has been recorded using the daily standing pouch check procedure. These data presented and comparisons made to previously collected information in the literature.

Standing Pouch Checks, Continued

Methods

Behavior and Breeding

Two adult Matschie's tree kangaroos were the focus of this study. The male "Ted", born May 4, 1980, came to the Metro Toronto Zoo in April, 1986 from Baton Rouge, on loan the National Zoo, Conservation and Research Center. The female "Emma", born December 7, 1990, came to the Metro Toronto Zoo in November, 1991 from Calgary Zoo, on loan from the Bronx Zoo, New York. The pair was first introduced in adjacent holding pens with a mesh dividing wall on June 6, 1992 and the two animals were put together for the first time on June 22, 1992.

On June 29, 1992, shortly after their first introduction, breeding was observed and was regularly observed thereafter. Copulations occurred during all months of the year. Typically, the male would approach the female and smell and lick her genital area and on several occasions would put his head inside the female's pouch. Both animals were heard to "tongue click" before and during breeding, while the female would perform small, quick head jerks. Breeding mainly took place on the ground, but also was attempted in the large tree branches in their enclosure. The male would mount the female from behind and grip her shoulders with his forelimbs, occasionally biting her neck. Breeding would continue on and off for 24 hours, as long as the female stayed in heat. Emma's estrous cycle was very regular, every 56-57 days. On three separate occasions, sperm plugs were found on exhibit substrate 24 hours after breeding. The female would also experience vaginal discharge and exhibit a very strong musty smell after breeding.

On numerous occasions Emma showed a very distinct change in behavior slightly before and in the beginning of her heat cycle. She became very agitated, moving around the exhibit a lot, licking her forelimbs and paws, as well as exuding a strong body odor. When she exhibited these signs, and the male was separated from her the door between the two enclosures was opened and breeding would then follow.

After each observed breeding session, the male was separated from the female 40 days after copulation. This was in accordance with recommendations from the tree kangaroo SSP Master plan, which states that all conspecifics be separated from the female 40 days after copulation to prevent any antagonistic interactions possibly causing loss of young. This is based on a 44-45 day gestation period. The female was then pouch checked every day until the 50th day and if no joey was present, the male was put back in the enclosure with the female again. If a joey was present, the female would remain separated from conspecifics until the joey was weaned and become totally independent from the pouch.

Even though breeding was observed and sperm plugs found in the enclosure, there was still no sign of a joey. The male "Ted" had previously been housed with another female for six years, also where no pregnancy occurred. Therefore, there were some concerns that Ted was not fertile. On March 3, 1993, reproductive work was done and showed normal, active spermatogenesis. During these tests, it was also noted that the male was in poor body condition. Upon his return from the health unit he was to remain separated from the female to increase his weight and improve body condition.

Daily pouch checks continued on the female. On May 25, 1993 Emma was pouch checked and nothing was found. On the following two days, no pouch checks were performed because Emma was irritable. On May 28, 1993 a pouch check was done and surprisingly the female was pouch gravid. Therefore, partition occurred either on the 43rd, 44th, or early morning on the 45th day after copulation.

Pouch Checking

The tree kangaroo SSP Master plan recommends that females should be pouch checked in order to determine if they are pouch gravid. This usually means manual restraint, which can be stressful to both animal and handler. It was decided to try to perform standing pouch checks with 0.1 tree kangaroo "Emma". When Emma came to us from the Calgary Zoo she

Standing Pouch Checks, *Continued*

had been acclimatized to people at a young age so that she could be used for outreach programs (pers. comm., John Creviston, zoo keeper Calgary Zoo).

At M.T.Z., when keepers were in the tree kangaroo exhibit, they would approach Emma and pet and stroke her. They would then slowly touch her pouch opening, each time increasing the time that they would keep their fingers on the pouch opening. The next step was to insert fingers into the pouch and eventually insert fingers and pull open the pouch. If at any time Emma showed any discomfort with the procedure, the keeper would stop and try to reassure Emma. It was important to make it a positive experience at all time. If Emma was up in the branches of the exhibit, treat foods were used to encourage her to come within reach of the keepers so that the training sessions could be performed. Emma was never forced to participate in the pouch training sessions. Sometimes, she would not come down and the training session for that day was aborted. The fact that Emma was acclimatized to people at a young age made training her relatively easy, yet persistence and positive training played an important role in our success. Standing pouch checks were incorporated into her normal daily routine to keep her familiar with the procedure. In addition, keepers were able to perform standing nail trims and overall check-ups without causing her any stress.

When it was discovered that Emma was pouch gravid, daily standing pouch checks were stopped. A protocol was drafted to continue pouch checks so that the development of the joey could be recorded. It was decided that daily pouch checks would continue and if Emma showed any discomfort during the procedure, the session was stopped. The use of a camera and video equipment was also slowly incorporated.

Two people were usually needed to perform pouch checks. One person would hold the pouch open and the other person would look inside. A veterinary pen light was used to see inside the pouch and a treat food was given to Emma to occupy her during the procedure. Bread, lettuce, and raspberry browse were the treat foods used most often (raspberry was the favorite).

On June 7, 1993, Emma was pouch checked for the first time after discovering that she was pouch gravid. The table in the results section chronicles the observations made during all subsequent pouch checks. The joey was fine and Emma showed no resistance to the procedure. For the first month and a half, Emma showed no signs of stress, but on some days she was less tolerant of the routine. She would occasionally lower her head and gently bite the keeper's hand. When the joey was approximately 68 days old, Emma accepted the pouch checking with little, if any, signs of irritability. She would actually look into the pouch at the same time as the keeper. In the 24th week, the joey had started to poke its head out of the pouch for the first time. In the 27th week, the joey had his head out of the pouch almost all the time, therefore eliminating the necessity to pouch check.



Standing Pouch Checks, Continued

Results

DEVELOPMENT OF YOUNG

Developmental stages observed using the daily pouch check procedure.

AGE (Weeks)	DEVELOPMENTAL CHARACTERISTICS
First day (week 1) *	Joey first observed in pouch, on upper nipple Approximately 1 inch in length
4	Hind legs and tail developed Joey approximately 2 inches long and moved to lower nipple
5	Joey approx. 2 1/2 in. long
7	Joey approx. 3 in. long and moved to top left nipple Claws on forelimbs visible and pigmented
8	Joey approx. 4 in. long
9	Joey approx. 5 in. long
11	Joey approx. 6 in. long Ears developing and still attached to head Eyes developing
12	Joey approx. 6 1/2 in. long Pouch starting to look distended Female stimulating joey to urinate by licking genital area *
13	Joey 7 in. long Ears semi-attached to head
14	Sex of joey established as male, observed penis
15	Eyes are starting to open Ears are free from head Fine hair appearing on nose
16	Fine hair on cloacal vibrissae Eyes still not open but medial grooves are getting bigger (deeper)
17	Joey approx. 7 1/2 - 8 in. long Appears to be putting on weight, rather than increasing height Still attached to nipple
18	First time observed not to be attached to nipple Penis erect
20	Eyes starting to open Foot hanging out of pouch with a lot of pouch movement
21	Eyes are open
22	Joey sticking various body parts out of pouch, have yet to see head out Joey still has hardly any hair on body * Female frequently keeping pouch opening very relaxed
24	Fine hair around rectal area Joey poked nose out of pouch
25	Joey's head first observed out of pouch

Standing Pouch Checks, Continued

AGE (Weeks)	DEVELOPMENTAL CHARACTERISTICS
26	Beginnings of darker fuzz on arms, legs and tail Dark skin pigmentation on tail
27	Head out of pouch constantly Getting more red hair on torso and head
28	Head and front forelimbs frequently out Joey observed mouthing food items
29	Hair coming in very quickly Body halfway out of pouch, showing play behaviour
30	Joey has lower and upper incisors
31	Observed eating small amount of different food items (lettuce, celery, banana)
32	Joey first observed out of pouch completely
40	Joey out of pouch permanently

Note:

* The delay between the first pouch check and the second was due to waiting for approval to continue pouch checking during the joey's development. There was also concern by the keepers that the joey be allowed to develop and grow before observations continued.

Discussion

The breeding of the Matschie's tree kangaroos at the Metro Toronto Zoo was observed to be indicative of typical behavior found at other institutions (Heath et al. 1990; Crook and Skipper 1987; Hutchins et al. 1991). SSP recommendations and the "Matschie's Tree Kangaroo Husbandry Notebook", were important tools that contributed to our success (Mullett et al. 1989). The male, thought to be infertile due to the fact that he had been housed with a female for years and had not sired any young, proved to be viable. Although electro ejaculation showed a low sperm count, a testicular biopsy showed normal active testis and sperm development. Therefore, it should be recommended that a full set of tests be done prior to dismissing an animal when fertility is in question. There is also the possibility that finding the "perfect" pair (behaviorally), plays an important role for successful breeding.

Successful copulation occurred after the animals had been paired for 11 months and several observed breeding incidents. Ongoing training with the female tree kangaroo to allow for standing pouch checks prior to pregnancy, enabled us to determine parturition within two days, between the 43rd and 45th day after copulation, which was consistent with Heath et al. (1990) findings, but not with Olds and Collins (1973) which predicted a gestation of between 32 and 35 days. In a more recent unpublished paper (Benner and Collins, cited by Dabek and Hutchins, 1990), a mean gestation period of 44.2 days was documented. At M.T.Z., this standing pouch check technique was continued during the joey's pouch development and allowed for closer observations and some unrecorded developmental stages. On day one, the joey was observed to be on an upper nipple in the pouch and when observed in the fourth week, was on a lower nipple. During the seventh week, he had moved again to the lower left nipple and remained there until he was observed actually off the nipple for the first time in the 18th week. Due to the absence of pouch checks after the first day to the fourth week, it is uncertain at what stage the hind legs and tail developed but it was between this period, after parturition. The size of the joey was approximated visually throughout the study and was recorded from one inch in length at birth, to seven and a half to eight inches at 17 weeks, at which point the joey started to increase in weight more than length. In later stages, the joey became very large in the pouch and it was difficult to estimate size.

Standing Pouch Checks, Continued

In the 11th week, the eyes started to develop and were completely open at 21 weeks, which corresponded with the range of 20-33 weeks given by Heath et al. (1990). The ears were free from the head at 15 weeks, which was four weeks longer than the observed 11 weeks documented by Heath et al (1990). Our finding that the joey put his head out of the pouch at 25 weeks does not coincide with what Dabek and Hutchins (1990) and Heath et al (1990) who found that the joey first put his head out of the pouch between 20 and 22 weeks. This variance could be due to individual characteristics by joeys, or the possibility that the M.T.Z. joey had showed his head earlier, during hours when keepers were not present. In this study, the joey was observed mouthing food at 29 weeks, but was not seen eating solids until the 31st week, which again does not agree with other findings; Heath et al.(1990) gave a range between 26 and 28 weeks in four individual animals eating solid foods and Dabek and Hutchins (1990) recorded 27.5 weeks.

When the joey was first observed out of the pouch at the M.T.Z., the female would only let him out on the ground, and continued to do this in the early stages. It is presumed that the female did not let the joey out of the pouch while up in the trees until she felt that the joey's motor skills were more developed. No data could be found in the literature to see if this happens in the wild or if it is a captive behavior. In other studies, the age when the joey was first observed out of the pouch varies; 28 weeks (Dabek and Hutchins, 1990), a range of 25-30 weeks (Heath et al. 1990), 43.6 weeks (Olds and Collins, 1973). At M.T.Z., the joey was first seen out of the pouch in the 32nd week, but it should be noted that when the joey was out, it appeared to be familiar with its surroundings and therefore could have been venturing out of the pouch at an earlier stage, during the night. In addition, the fact that the joey was familiar with its surroundings, may lend credence to the assumption that tree kangaroos are nocturnal. These characteristics may be at present unbeknownst to keepers. The use of infra red cameras at night may answer this question. A period of novelty documented by Dabek and Hutchins (1990) also occurred with the M.T.Z. joey, where the joey was seen at least once a day out of the pouch, exploring, for approximately one week and then was hardly observed out of the pouch for several weeks before again gradually increasing the amount of time out of the pouch. In the 38th week, the female started "locking" the joey out of the pouch for longer periods of time and the joey exited the pouch permanently at 40 weeks of age. This is one week sooner than findings of 41 weeks by Dabek and Hutchins (1990).

There are some differences in the findings of joey development for the Matschie's tree kangaroo. With little literature on the subject, it is difficult to offer conclusive reasons to explain this. Without the consistent captive situation among institutions, there is little opportunity for consistent observations among individual animals. Finally, as in any captive situation, the effect of the presence of visiting public or even keepers may alter the opportunity for observations to be similar. Therefore it is very important for institutions to continue to learn more about the development and general behavior of this species. It is also important to obtain information from the wild so that comparisons can be made to benefit the captive population and to help increase breeding success (Dabek and Hutchins 1990; Hutchins et al. 1991; Tree kangaroo SSP Master Plan).

The training of female tree kangaroos to perform standing pouch checks is very beneficial for obtaining further information on joey development without causing undue stress to the animal. The animal becomes a lot more comfortable with its captive environment, which also allows for more frequent, unrestrained health check-ups and routine procedures. This is important, as tree kangaroos appear to be very susceptible to stress (Steenberg and Smith, 1990). When performing this technique, it is important to be consistent and to try to limit the number of people involved. This will allow for more expedient training of the animal, more accurate data to be recorded and will be less confusing to the animals involved. The use of cameras and video equipment will also help to document the joey development and should be incorporated at an early stage so that the female has time to get used to their presence.

Although there has been no loss of joey during manually restrained pouch checks to determine parturition (Steenburg, 1988), standing pouch checks are less invasive and less stressful to the animal and can be incorporated into the animals' daily routine. It also

Standing Pouch Checks, Continued

enables the joey to be acclimatized to keepers at an early age. This makes for easier management and handling of the joey when it is comfortable with its keepers. In addition, there seems to have been a correlation between manually restrained pouch checks and subsequent deaths of the joeys during attempts to study further joey development. There is no doubt that being able to closely study the early life history traits of Matschie's tree kangaroos will allow for a better understanding of this and other tree kangaroo species and a greater chance of saving them for the future.

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KENTUCKY - Scott Wright, Cleveland Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109
LOUISIANA - Rhonda Votino, 3535 Houma Blvd., Apt. 109, Metairie, LA 70006
MAINE - Jeanette Nadeau (see addresses under CT)
MARYLAND - Theresa Maas, Philadelphia Zoo, 34th & Girard Ave., Philadelphia, PA
MASSACHUSETTS - Jeanette Nadeau (see addresses under CT)
MICHIGAN - Tim Sampson, John Ball Zoo, 1300 W. Fulton, Grand Rapids, MI 49504
MINNESOTA - Tim Hill, Minnesota Zoological Gdns., 13000 Zoo Blvd., Apple Valley, MN 55124
MISSISSIPPI - Jeannie Frazier, Jackson Zoological Park, 2918 W. Capitol, Jackson, MS 39209
MISSOURI - Brian Kohler, Lee Richardson Zoo, P.O. Box 499, Garden City, KS 67846-0499
MONTANA - Holly Liappas (see address under Idaho)
NEBRASKA - Carla Wieser (see address under Iowa)
NEVADA - Patricia Simonet, Wildlife Safaris, P.O. Box 6735, Incline Village, NV 89450
NEW HAMPSHIRE - Jeanette Nadeau (see addresses under CT)
NEW JERSEY - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460
EAST NEW YORK - Frank Leonard, Bronx Zoo, 185th & Southern Blvd., Bronx, NY 10460
WEST NEW YORK - Alan Baker, Burnet Park Zoo, 500 Burnet Park Dr., Syracuse, NY 13204
NORTH CAROLINA - Kristin LaHue, Riverbanks Zoo, P.O. Box 1060, Columbia, SC 29202-1060
NORTH DAKOTA - Bob Debets, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba
Canada R3P 0R5 (204) 986-6921 [w]
OHIO - Scott Wright, Cleveland Metroparks Zoo, 3900 Brookside Park Dr., Cleveland, OH 44109
OKLAHOMA - Debbie Jackson or Ann Rademacher (see addresses under AR)
OREGON - Anna Michel, Washington Park Zoo, 4001 SW Canyon Rd., Portland, OR 97221
PENNSYLVANIA - Theresa Maas, Philadelphia Zoo, 3400 W. Girard, Philadelphia, PA 19104
RHODE ISLAND - Jeanette Nadeau (see addresses under CT)
SOUTH CAROLINA - Kristin LaHue, Riverbanks Zoo, P.O. Box 1060, Columbia, SC 29202-1060
SOUTH DAKOTA - Bob Debets (see address under ND)
TENNESSEE - Gail Karr or Cindy Finger, Memphis Zoo & Aquarium, 2000 Galloway,
Memphis, TN 38112
TEXAS - Connie Dieringer, Caldwell Zoo, P.O. Box 4280, Tyler, TX 75712
VERMONT - Jeanette Nadeau (see addresses under CT)
VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104
WEST VIRGINIA - Theresa Maas, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104
WISCONSIN - Wayne Hazlett, 3768 S. 89th St., Milwaukee, WI 53228
WYOMING - Holly Liappas (see address under Idaho)
DISTRICT OF COLUMBIA - Theresa Maas (see address under PA)
Provinces of Manitoba & Saskatchewan - Bob Debets (see address under ND)
Provinces of Alberta & British Columbia - Grant Tkachuk, 10139 157th St., #206, Edmonton,
Atlantic Canada - Bernard Gallant, RR # 7, 1081 Ryan Road, Moncton, N.B., E1C 8Z4

Vacancies exist for the following States or Provinces: Alaska, Arizona, Southern California, Colorado, Hawaii, New Mexico, Utah, Washington, Ontario and Quebec.

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKF, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is 913-273-1980.

CURATOR OF EDUCATION...requires experience as a zoo educator or involvement in zoo education program. Degree preferred. teacher certificate a plus but not required. Applicant must be highly motivated, self starter, capable of supervising staff. Must be neat, professional and able to deal with the public and be at ease with public speaking. Computer literacy a must. Salary \$19,000 - \$24,000 depending on experience, plus benefits. Contact Bob Brown for more information or send resumé to: Rolling Hills Refuge Wildlife Conservation Center, 625 N. Hedville Road, Salina, KS 67401. (913) 827-9488. Closing date for applications is **15 June 1995**.

ZOOKEEPER/AQUARIUM...requires high school diploma and preferably a BS in a related field with one year's work experience. Responsible for care and maintenance of fishes and aquarium exhibits. SCUBA certification desired. Starting salary \$19,302.00 per year with benefits. Submit resumé **by 30 June 1995** to: Nancy Foley, Director of Human Resources, The Toledo Zoological Society, P.O. Box 4010, Toledo, OH 43609.

The following two (2) positions are available at the North Carolina Zoological Park. For either position send resumé and cover letter by 30 June 1995 to: Human Resources, North Carolina Zoological Park, 4401 Zoo Parkway, Asheboro, NC 27203, Attn: Guy Lichty.

MAMMAL SUPERVISOR (Zookeeper III)....the North Carolina Zoological Park (NCZP) is seeking candidates for the position of mammal supervisor in the African region of the zoo. Species in this area include primates, carnivores, hoofed stock and ratites. Experience with great apes, particularly chimps, and strong supervisory, interpersonal, and organizational skills are desired. For this position a four-year degree in zoology or a related field is preferred, as well as two year's supervisory experience at an accredited zoo. Starting salary for this position is \$21,493.00 plus benefits.

ZOOKEEPER - Elephants/Rhinos...The NCZP is accepting resúmes from zookeepers with elephant handling experience, willing to be part of a progressive elephant management team, working with an African bull and three cows. This team of keepers, supervisors and curators is utilizing operant conditioning and an elephant restraint chute in a protected contact system of elephant management. Other responsibilities will include the care and feeding of rhinos and a variety of African hoofed stock and birds. For this position a four-year degree in zoology or related field is preferred as well as two year's experience at an accredited zoo. Starting salary for this position is \$16,268.00 plus benefits.

CURATOR...the Wildlife Discovery Program (a Houston I.S.D. Magnet School) is now taking applications for the 1995-96 school year. The Curator position vacancy will become available 18 August, 1995, and continue until 31 May, 1996 (10 month contract/benefits). The duties of this position include planning and experiential instruction in an outdoor setting at the Houston Zoo to 3rd grade students. Requirements are two or more of the following: High school diploma (required); education experience; wildlife biology background; environmental/outdoor education experience; or summer camp counselor experience. Salary \$1030.00/month for 10 months with benefits. Applications will be accepted until **15 July, 1995**. Send cover letter with resumé and three (3) references to: Ms. Karyl Walz, Coordinator, Wildlife Discovery Program, 1513 North MacGregor Way, Houston, TX 77030.

CHIMPANZEE CAREGIVER...one full-time position open. Requires two years of college level course work, two years experience in the care of exotic animals; OR an equivalent combination of experience which provides the required knowledge, skills, and ability. Primate experience a plus. Assist in the responsibility of caring for approximately 80 Chimpanzees (*Pan troglodytes*) in a breeding colony. Must be willing to make at least a two-year commitment. Excellent benefits. EOE. Applicant must have a negative TB skin test, negative hepatitis B surface antigen test, and evidence of a measles booster or natural disease prior to employment. Send letter of interest (with requested salary), resumé and three letters of reference to: Jo Fritz, Director, Primate Foundation of Arizona, P.O. Box 20027, Mesa, AZ 85277-0027. Position open until filled.

Opportunity Knocks, Continued

ZOOKEEPER/Psittacines...requires minimum of one year paid, hands-on experience with Macaws and degree or equivalent Zoo-related experience. Daily duties include care, feeding, habitat upkeep, breeding programs, record keeping, medical coordination, training, acquisitions, supervising part-time staff and volunteers, presenting educational programs, etc. Must be willing to work weekends/holidays. Starting salary \$15,000-\$20,000 with year-end bonus and benefits. Excellent growth potential. Salary commensurate with experience. Send resumé/references to: Washington Zoological Park, 19525 SE 54th, Issaquah, WA 98027. Fax (206) 392-1076. Position open until filled.

ZOOKEEPERS...Woodland Park Zoo. Salary \$2,381.00 per month. Permanent full-time & part-time. Assist with care of variety of animals. Prepare special foods and diets, infant feedings, clean and disinfect animal and exhibit areas, administer medications, make and record observations, prepare reports, assist with movement of animals and animal training, give visitor talks and interact with the public. Requires equivalent of two (2) years of experience caring for zoo specimens in an accredited facility. Send resumé **by 3 July 1995** to: S. Bergstrand, Seattle Personnel Dept., 1219 Dexter Horton Bldg., Seattle, WA 98104-1793. AA/EOE.

ZOOKEEPER...we are looking for a very special person. The person we seek will have had at least three years' work experience in a paid, full-time position, not as a volunteer or docent. This person should have extensive hands-on experience not only in cleaning and feeding, but also in capture, restraint, and handling of a variety of mammals, birds and reptiles. We want someone who is interested in learning and developing their own skills and abilities. In return, we are offering the chance to grow professionally and to make a salary between \$19,000 and \$21,000 with paid medical and vacation. If you know you are the person we want, send your resumé to: Vince Hall, Claws 'N' Paws Wild Animal Park, RD 6, Lake Ariel, PA 18436.

The following two (2) positions are available at the Brookfield Zoo. For either position send resumé to: Carol McCarthy, Animal Collection, Chicago Zoological Society, Brookfield Zoo, 3300 Golf Road, Brookfield, IL 60513. Deadline for application is 30 June 1995. EOE - M/F/V/D.

SUPERVISORY KEEPER...Elephant training/handling experience required; operant conditioning experience and previous supervisory experience beneficial. Degree in zoology or related field preferred. Will lead a 6-member team in daily operation of pachyderm building which includes maintenance of hippo, rhino and tapir collection in addition to African elephants. Will help facilitate transition of facility, staff and elephants from free contact to protected contact. Duties will also include a variety of educational tours and public demonstrations. Annual salary range is \$33,000-\$36,000.

PACHYDERM KEEPER...entry level or intermediate level position in handling/training elephants. General animal training experience beneficial; degree in zoology or related field preferred. Must be able to work in protected contact situations. Operant conditioning experience beneficial. Will be a member of a 6-person team and participate in public demonstrations. Duties will also include maintenance of hippo, rhino, and tapir collection. Annual salary range \$27,000-\$32,000.



AAZK Membership Application

check here if renewal []

Name _____

Address _____

City _____ State/Province _____ Zip _____

U.S. Members

Canadian Members

☐ **\$30.00 Professional/U.S.**
Full-time Keepers

☐ **\$35.00 Professional/Canada**
Full-time Keepers

☐ **\$25.00 Affiliate/U.S.**
Other staff & volunteers

☐ **\$30.00 Affiliate/Canada**
Other staff & volunteers

☐ **\$25.00 Associate/U.S.**
*Those not connected with
an animal facility*

☐ **\$30.00 Associate/Canada**
*Those not connected with
an animal facility*

☐ **\$50.00 or up Contributing/U.S.**
Individuals

☐ **\$55.00 or up Contributing/Canada**
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☐ **\$50.00 or up Institutional/U.S.**
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(requires Board approval)*

☐ **\$55.00 or up Institutional/Canada**
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\$40.00 International
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Canada regardless of category*

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Zoo Address _____

Title _____

Work Area _____

☐ My check is enclosed (AAZK, Inc.) ☐ Please charge to my credit card

MASTERCARD _____ VISA _____ Card # _____ - _____ - _____ - _____

Name on card _____ Expiration Date _____

Signature _____

Mail this application to: AAZK Administrative Offices, Topeka Zoo, 635 S.W. Gage Blvd.,
Topeka, KS 66606-2066 U.S.A. Make checks/money orders payable to AAZK, Inc. Must
be in U.S. FUNDS ONLY.

Membership includes a subscription to Animal Keepers' Forum. The membership card is good for
free admission to many zoos and aquariums in the U.S. and Canada.

of Zoo Keepers, Inc.
635 S.W. Gage Blvd.
Topeka, KS 66606-2066

Address Correction Requested



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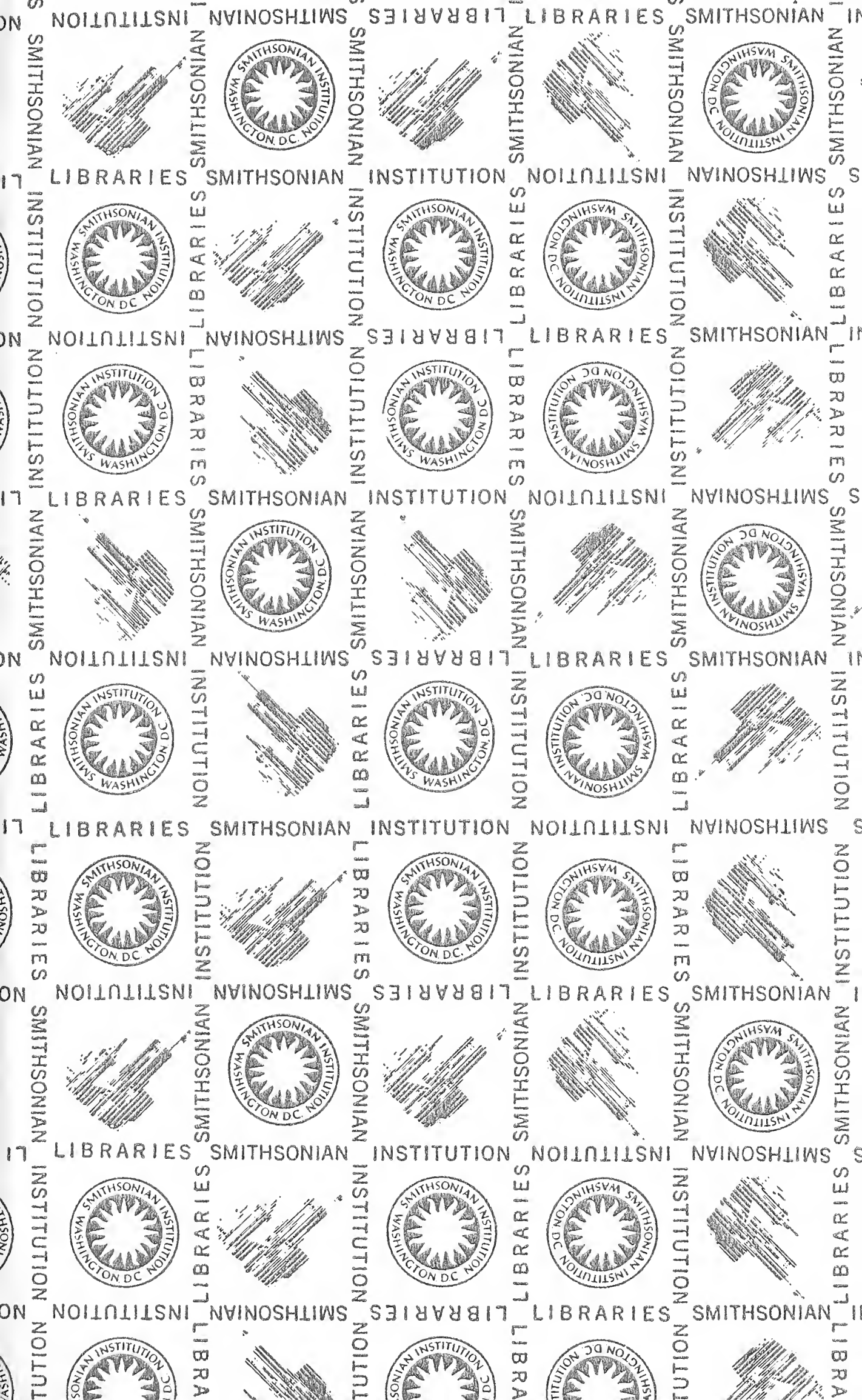
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